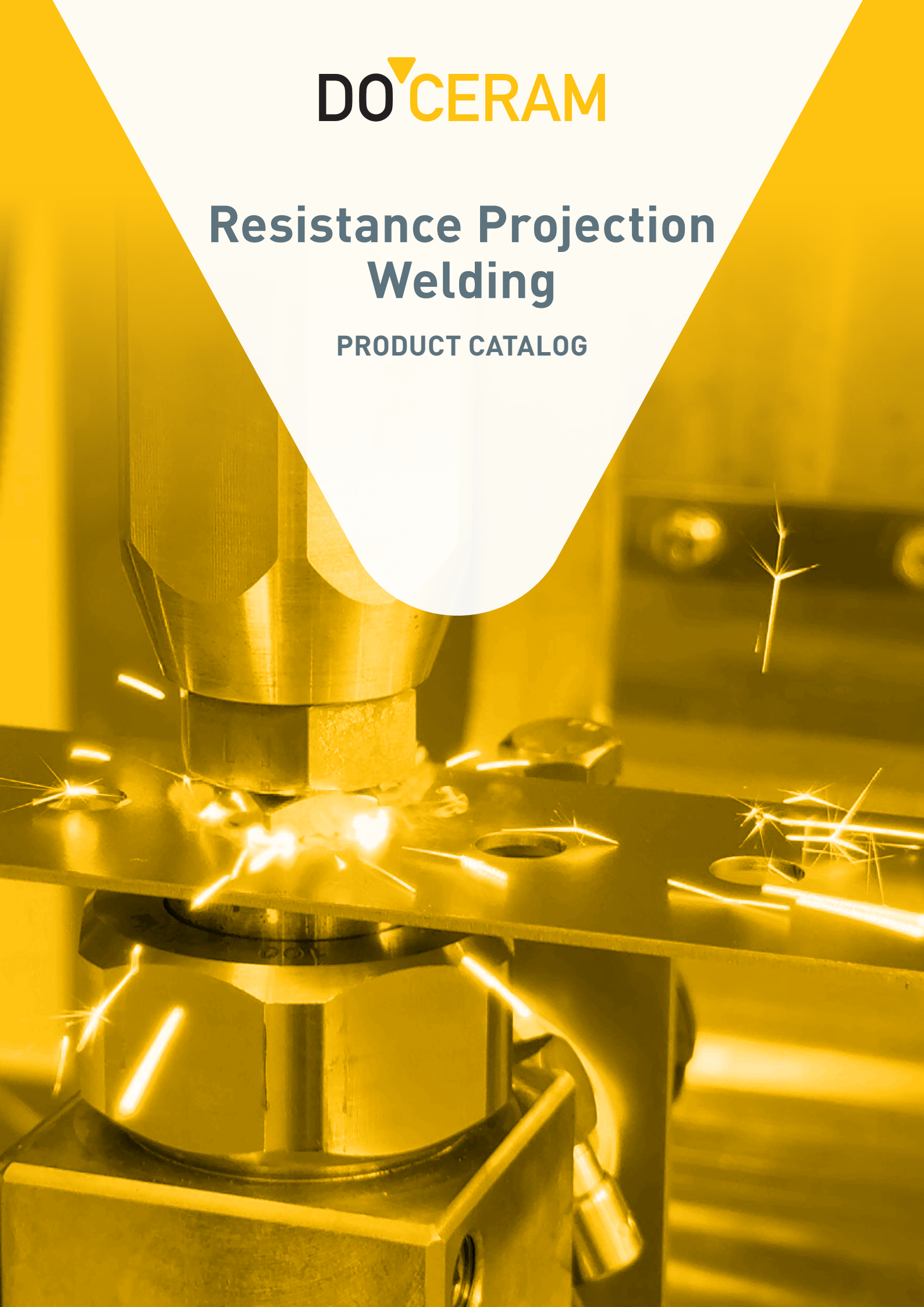


The logo for DO CERAM, with 'DO' in black and 'CERAM' in yellow. A small yellow triangle is positioned above the 'O' in 'DO'.

DO CERAM

Resistance Projection Welding

PRODUCT CATALOG



CONTENT

Projection welding tools	4
Upper electrode	6
Lower electrode	12
Complete electrode	14
ModulMaster Pro	30
ModulMaster Evo	44
CC-Master (PLC)	56
CAD-Portal	58
Engineering of welding tools	60
Welding laboratory	62
Did you know...?	64
Locating pins	66
Dowel pins	70
Screw head insulation	71

PROJECTION WELDING TOOLS

MADE IN DORTMUND

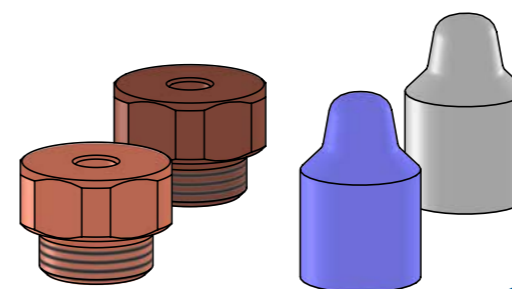
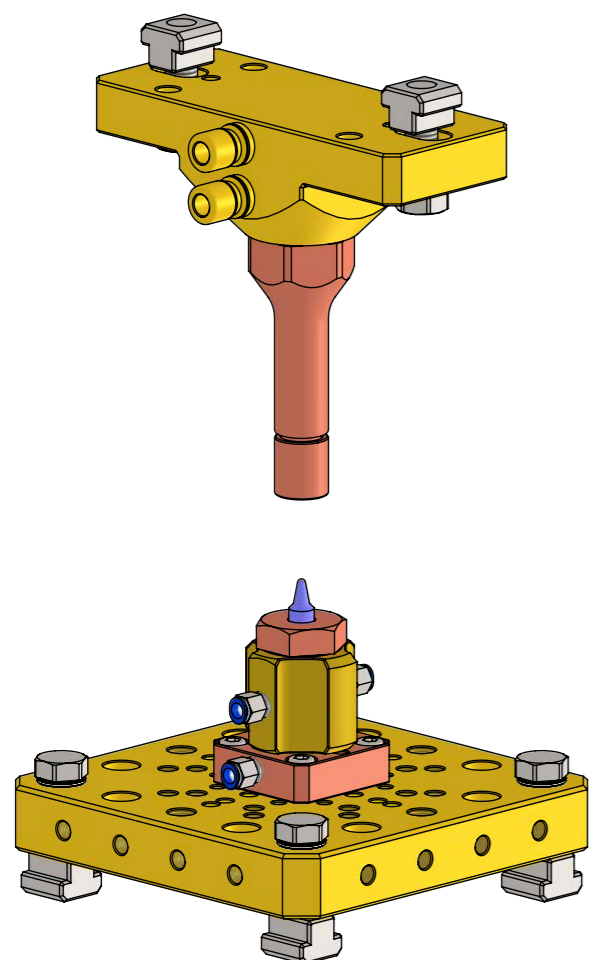
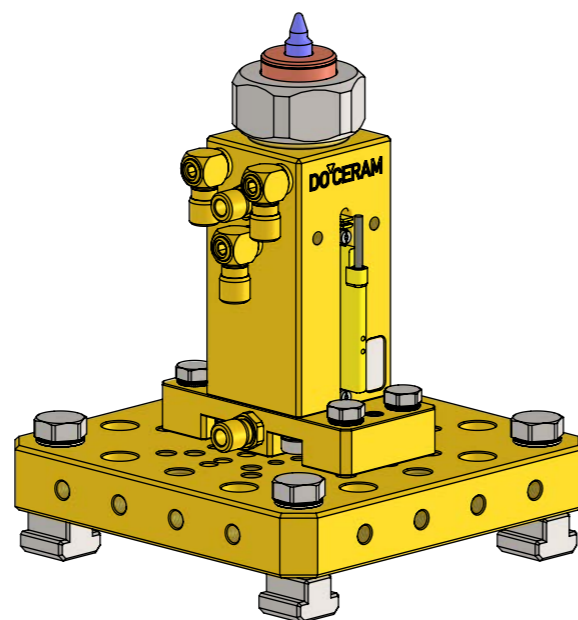
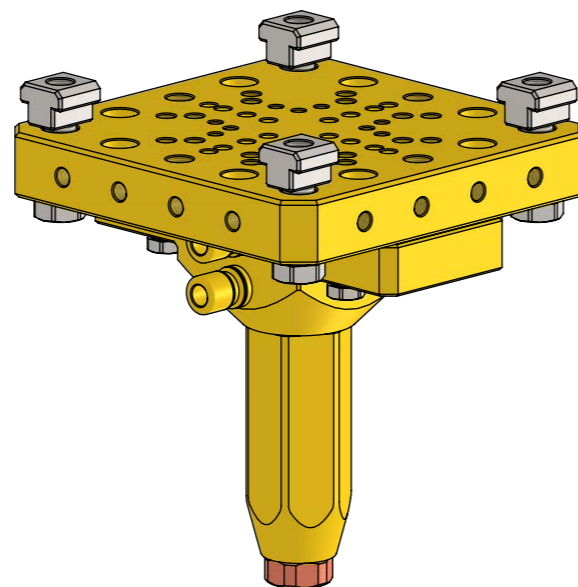
Efficient and precise welded joints are essential for industrial production processes. Our projection welding tools, consisting of upper electrodes, lower electrodes such as the Modul-Master Pro or complete electrodes, set new standards in terms of performance and reliability. Each electrode has been specifically designed to ensure consistently high welding quality even under extreme conditions.

Rely on our modular portfolio, which has already proven itself a thousand of times in the market.

The DOCERAM portfolio in this catalog was developed on a modular basis, allowing everyone the opportunity to assemble their own device. Our application engineers are happy to provide guidance every step of the way.

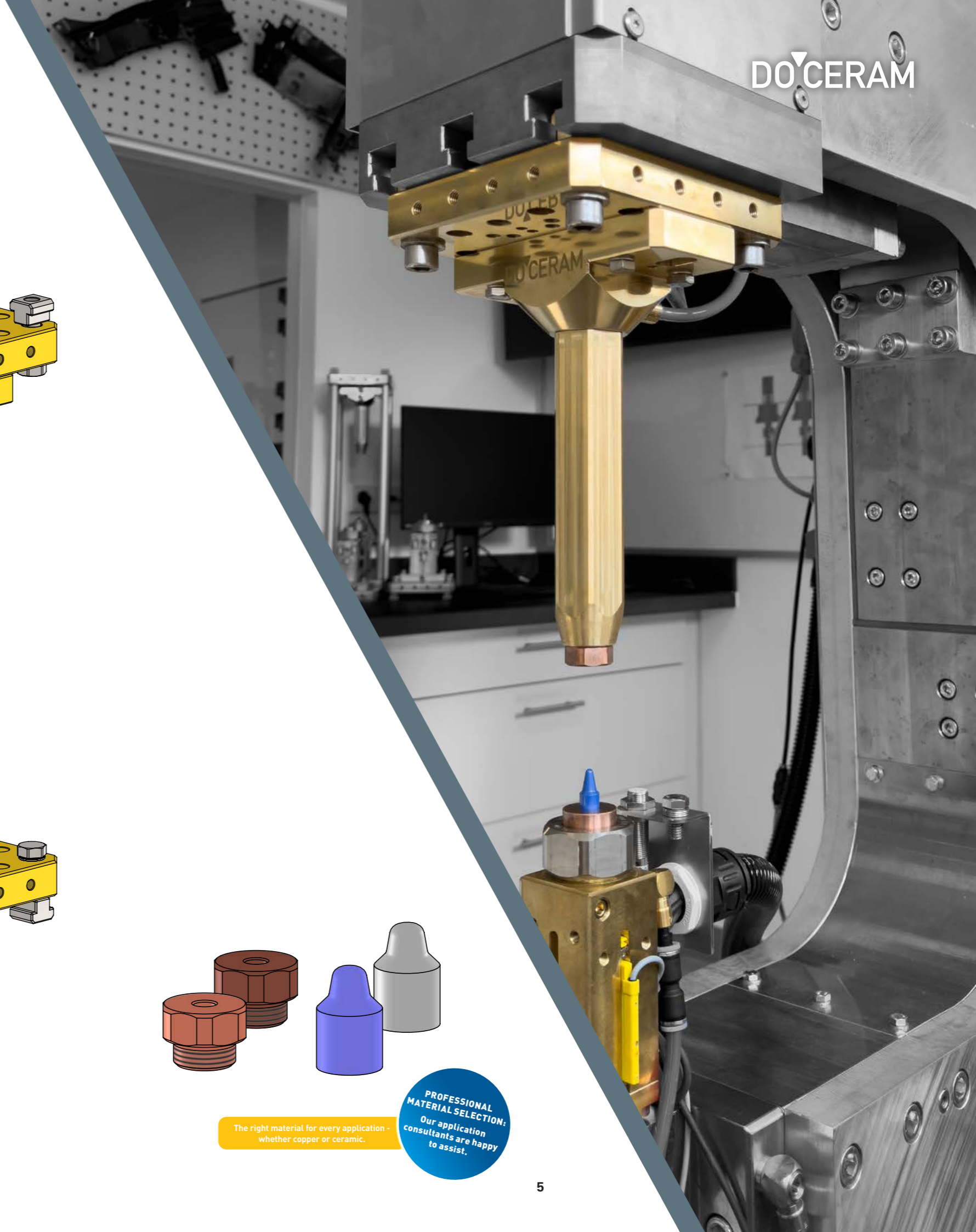
Thanks to their precise fit, our upper and lower electrodes ensure even energy transfer and consistent welding results - from the first to the last projection.

On the following catalog pages, we provide detailed information about each product, helping you make the optimal choice for your needs. Discover proven quality and innovation in projection welding technology - for more efficient processes, maximum service life and excellent welded joints.



The right material for every application - whether copper or ceramic.

PROFESSIONAL MATERIAL SELECTION:
Our application consultants are happy to assist.



UPPER ELECTRODE

STABILITY IN THE WELDING PROCESS

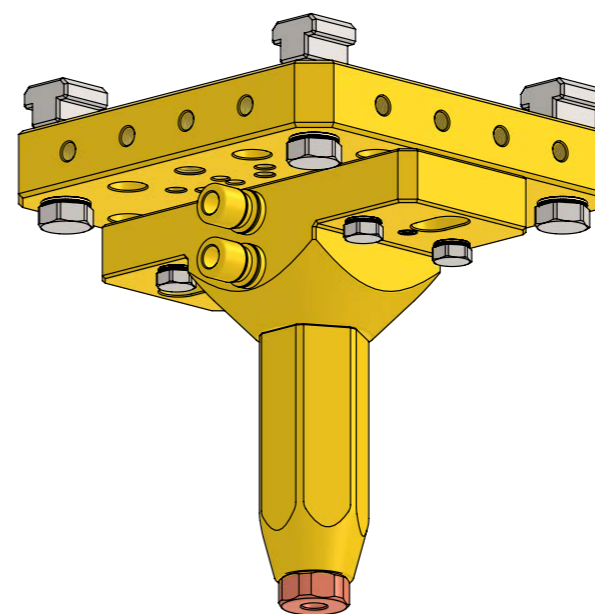
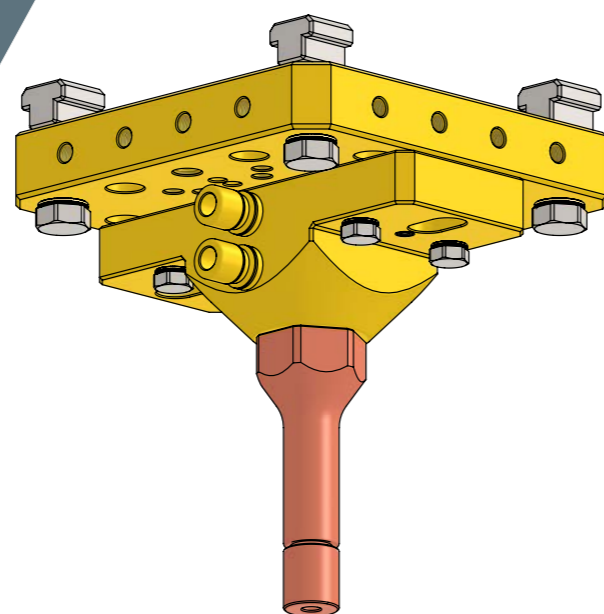
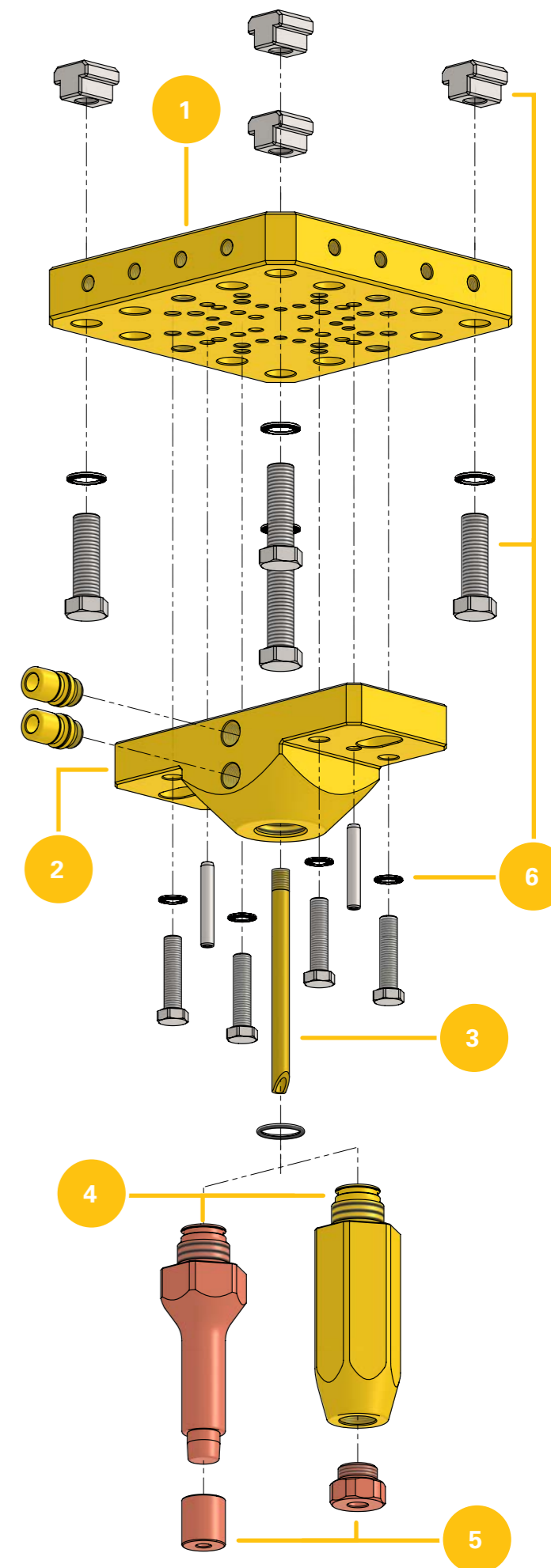
The upper electrode plays a crucial role in the welding process by transferring the welding current to the workpiece in a targeted manner, ensuring precise and high-quality joints.

Its construction is designed for maximum efficiency and durability, making it ideal for demanding applications in series production. The resulting rigidity and the use of advanced materials ensure that the upper electrode delivers consistent energy input and power transmission.

The wear electrodes are effectively cooled by an innovative cooling mechanism, which significantly increases their service life.

Components at a glance:

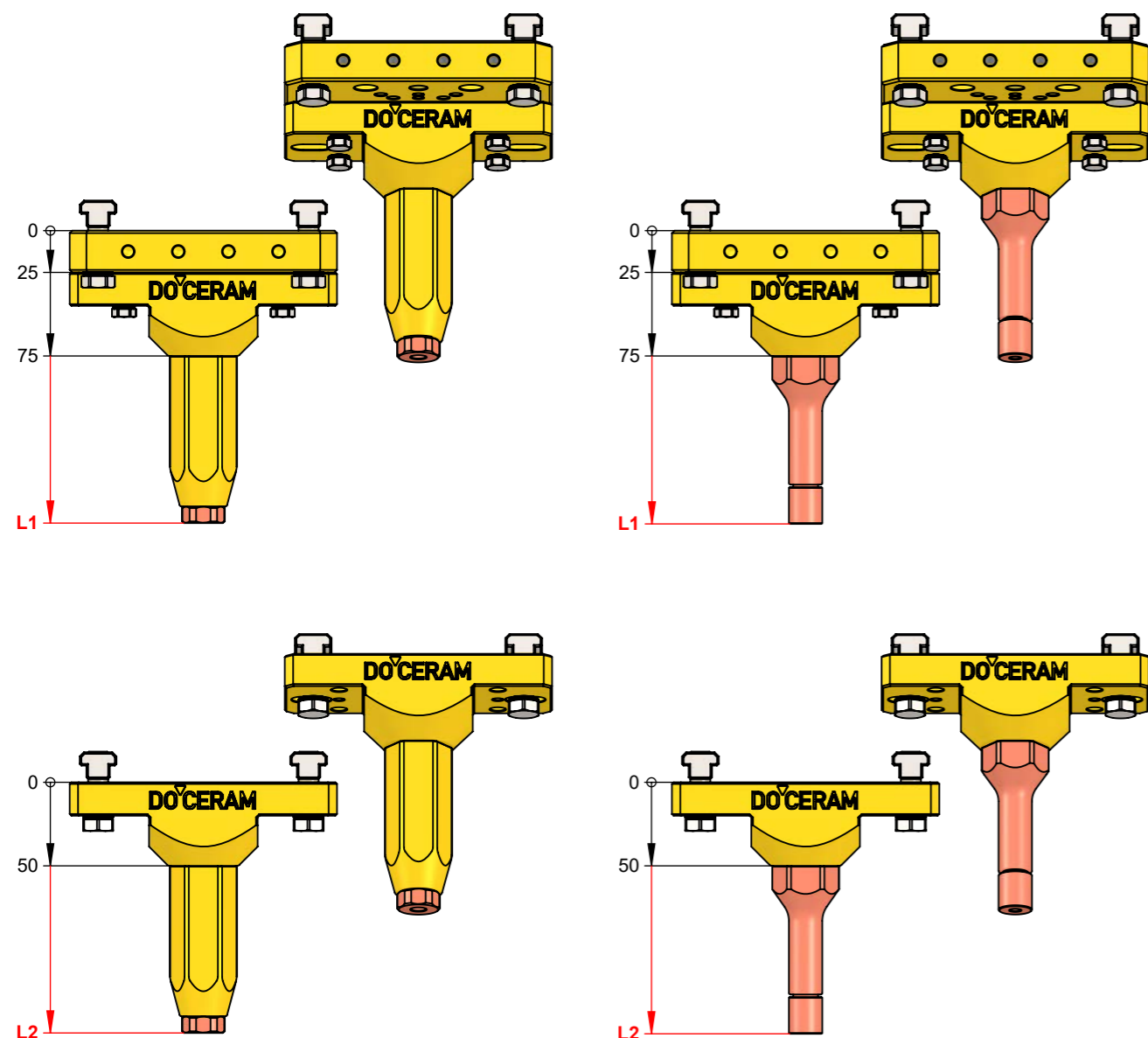
1. Base plate
2. Electrode holder
3. Cooling tube
4. Electrode shank
5. Wear electrode
6. Accessories e.g. sliding blocks, screws, hose connections, dowel pins, etc



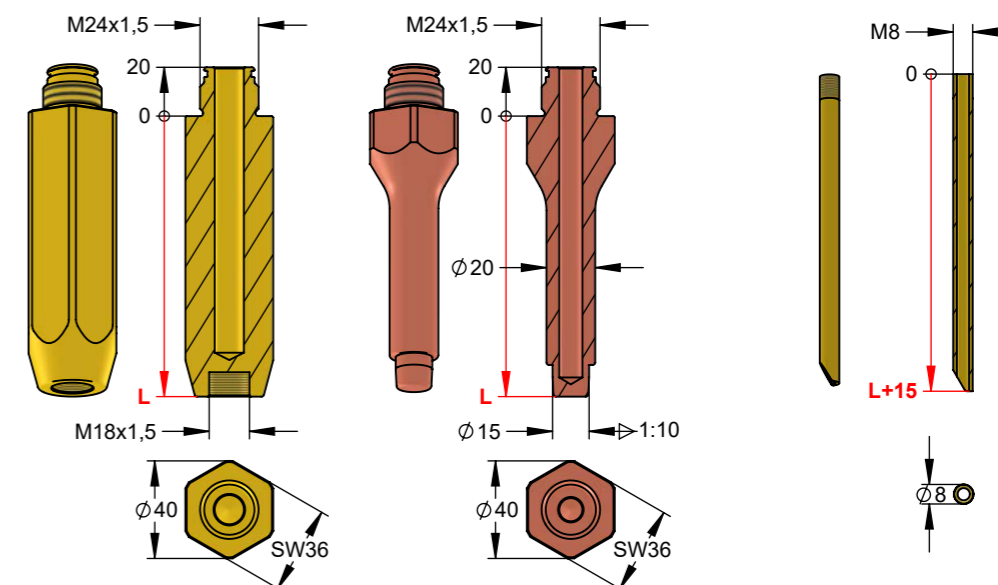
UPPER ELECTRODE PRO

UPPER ELECTRODE WITH AND WITHOUT BASE PLATE

Overall length with base plate L1	150	175	200	225	250	275	300
Overall length without base plate L2	125	150	175	200	225	250	275
Required shank length L	40	65	90	115	140	165	190



ELECTRODE SHANK

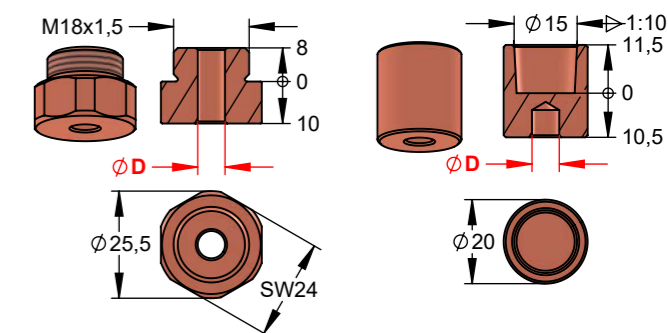


L	Electrode shank Pro (2.0401)	Electrode cap holder Pro (2.1293)	Cooling tube (2.0401)
40	1705830040	1111820040	1705840040
65	1705830065	1111820065	1705840065
90	1705830090	1111820090	1705840090
115	1705830115	1111820115	1705840115
140	1705830140	1111820140	1705840140
165	1705830165	1111820165	1705840165
190	1705830190	1111820190	1705840190

DON'T FORGET THE O-RING (N3601N18020)!

WEAR ELECTRODES

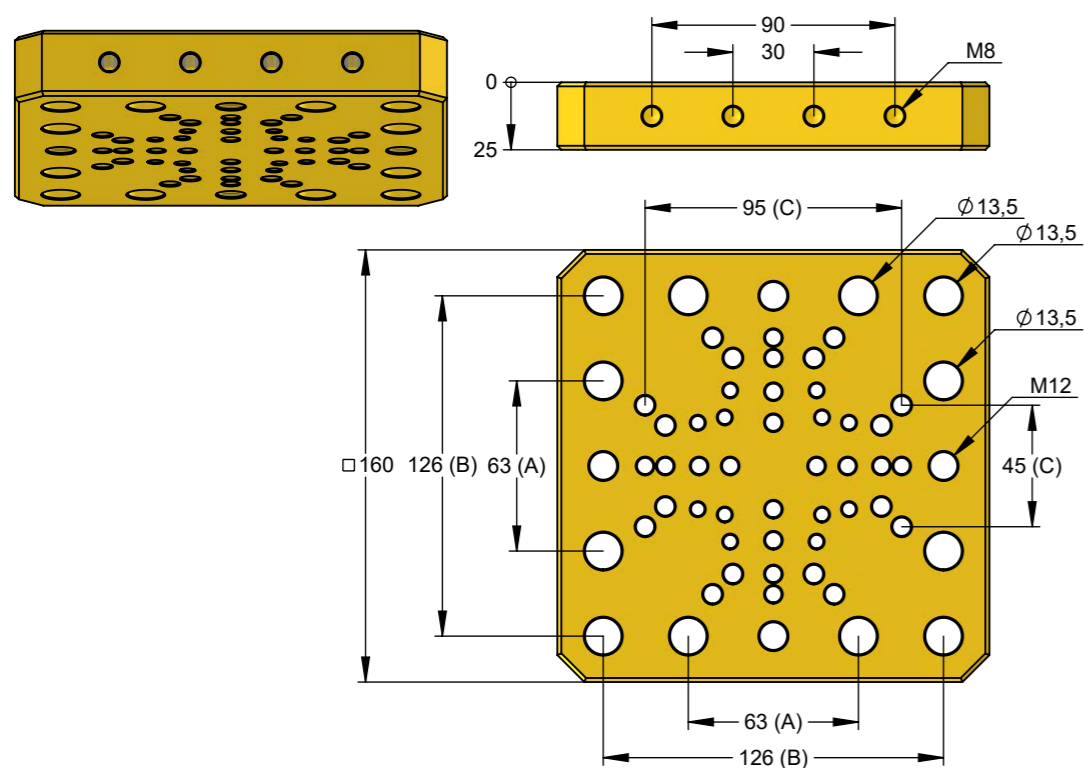
D	Screw-in electrode (2.1293)	Electrode cap (2.1293)
3,0	111182418030	111181020030
3,5	111182418035	111181020035
4,0	111182418040	111181020040
4,5	111182418045	111181020045
5,0	111182418050	111181020050
5,5	111182418055	111181020055
6,0	111182418060	111181020060
6,5	111182418065	111181020065
7,0	111182418070	111181020070
7,5	111182418075	111181020075
8,0	111182418080	111181020080
8,5	111182418085	111181020085
9,0	111182418090	111181020090
9,5	111182418095	111181020095
10,0	111182418100	111181020100



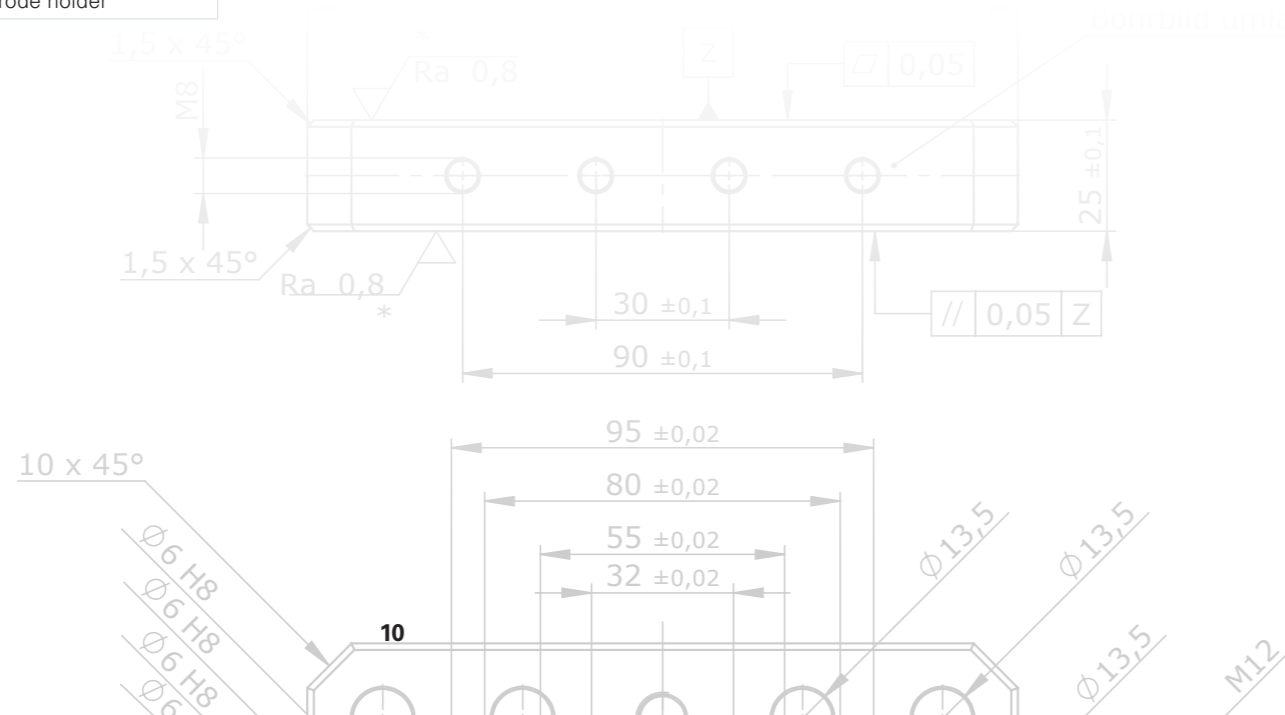
D	Screw-in electrode (2.1293)	Electrode cap (2.1293)
10,5	111182418105	-
11,0	111182418110	-
11,5	111182418115	-
12,0	111182418120	-
12,5	111182418125	-
13,0	111182418130	-

BASE PLATE

Description	Material	Item No.
Base plate Pro	2.0401 (CuZn39Pb3)	1705811616

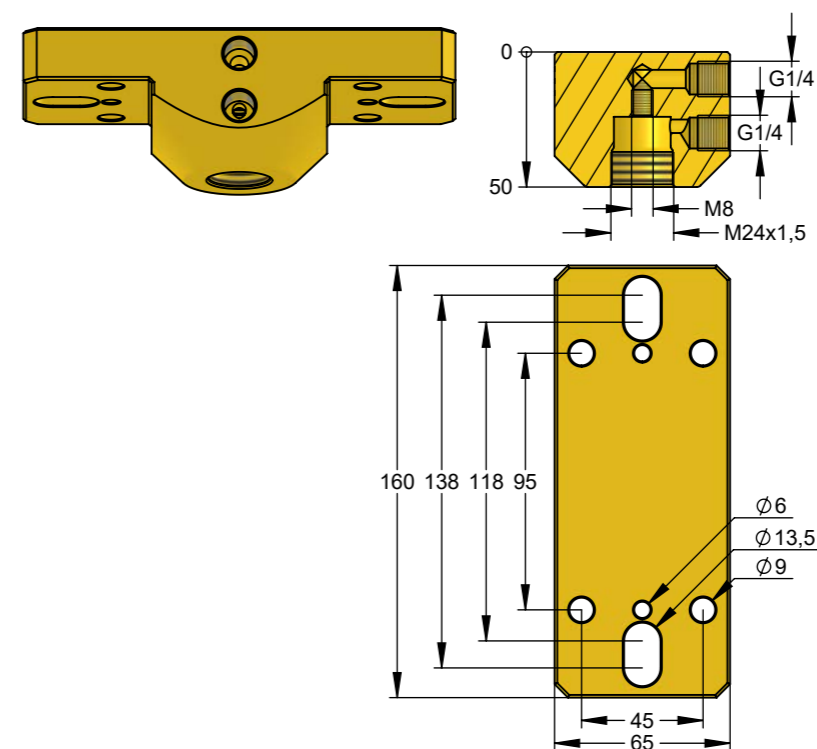


Dimension	Installation situation
A	Installation on 4-slot table
B	Installation on 3-slot table
C	Electrode holder



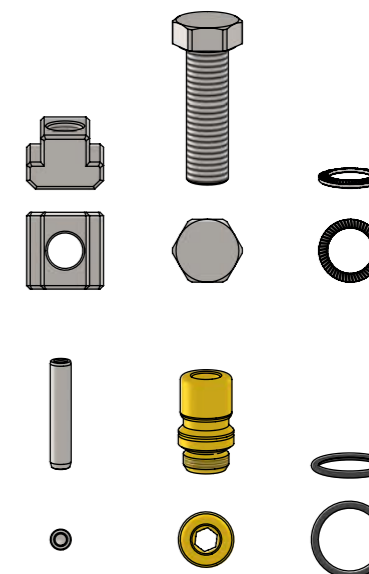
ELECTRODE HOLDER

Description	Material	Item No.
Electrode holder Pro	2.0401 (CuZn39Pb3)	1705820050



ACCESSORIES

Description	Material	Item No.
Nut for T-slots 14 mm	Stainless steel A4	N508N1412
Hexagon head screw M12x40 mm	Stainless steel A2	N4017N12040
Hexagon head screw M8x35 mm	Stainless steel A2	N4017N08035
Schnorr® lock washer for M12	Stainless steel A2	N0000N13018
Schnorr® lock washer for M8	Stainless steel A2	N0000N08413
Dowel pin with internal thread Ø6x40 mm	Stainless steel C1	N8735N06040
O-ring Ø18x2 mm	NBR 70	N3601N18020
Hose connection G1/4 for 8 mm hose	Brass	1116300013



LOWER ELECTRODE

PRECISION AND DURABILITY FOR DEMANDING WELDING APPLICATIONS

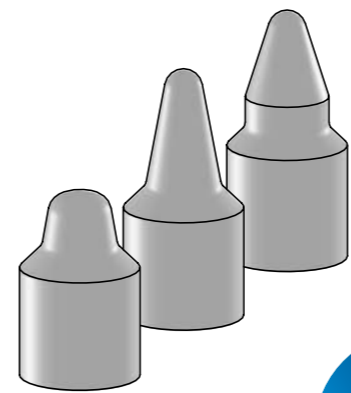
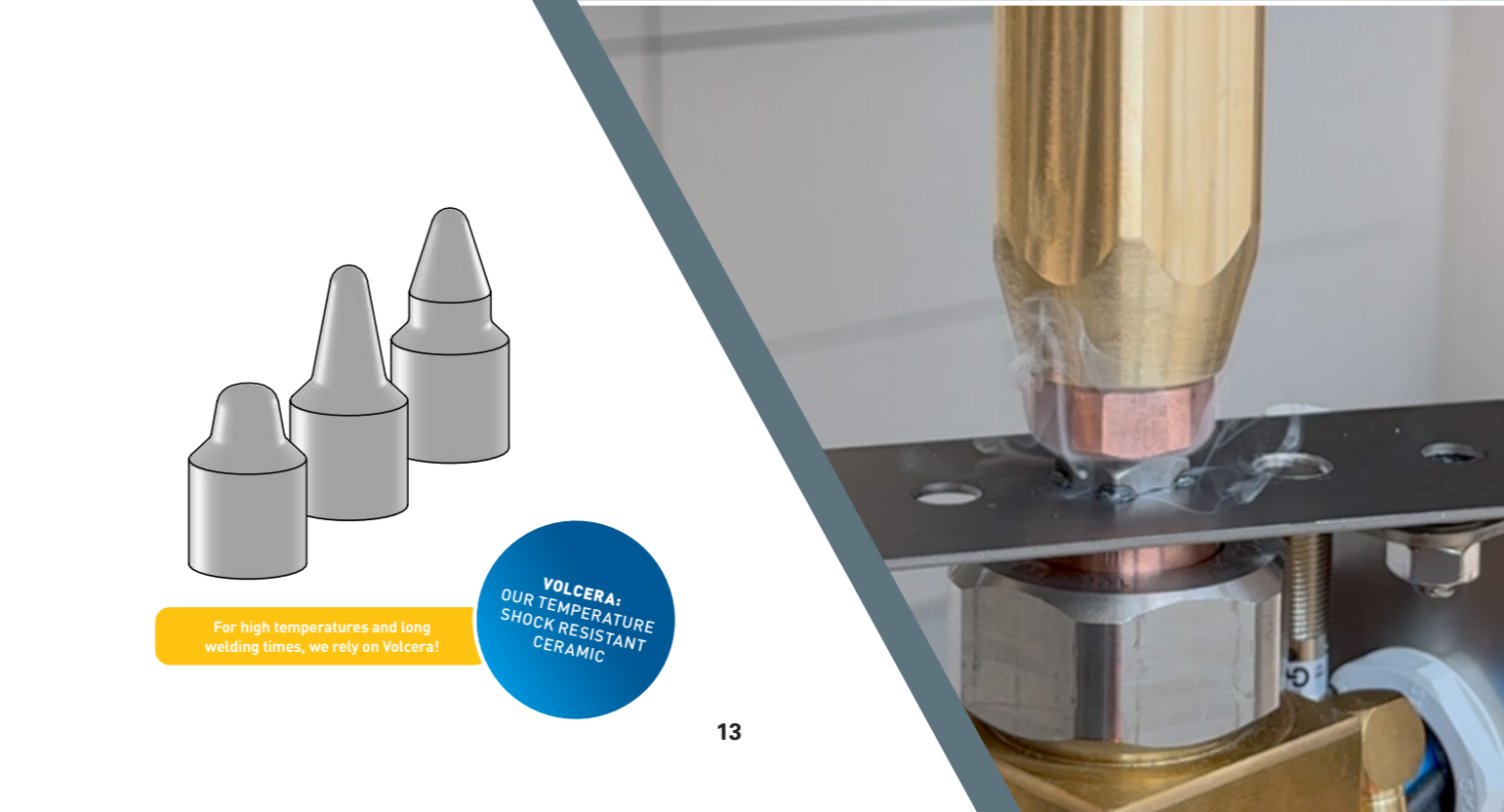
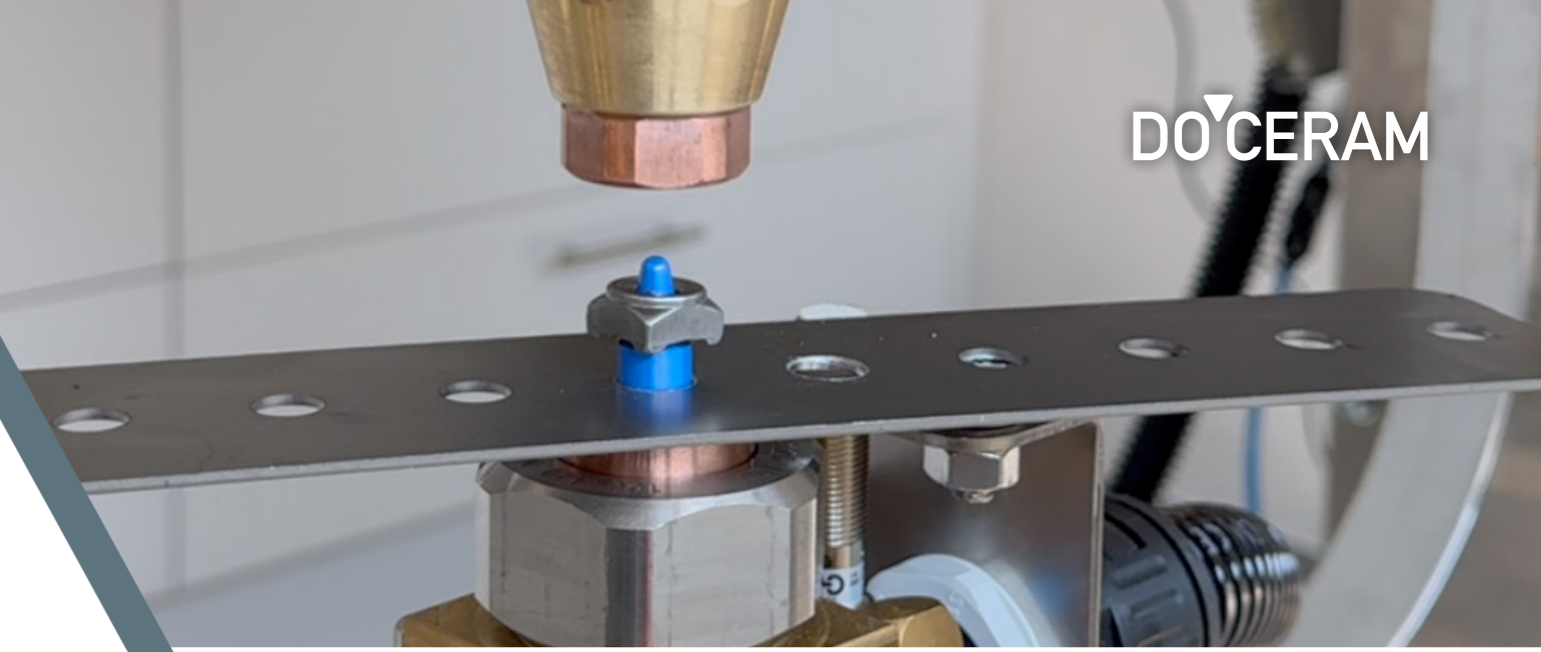
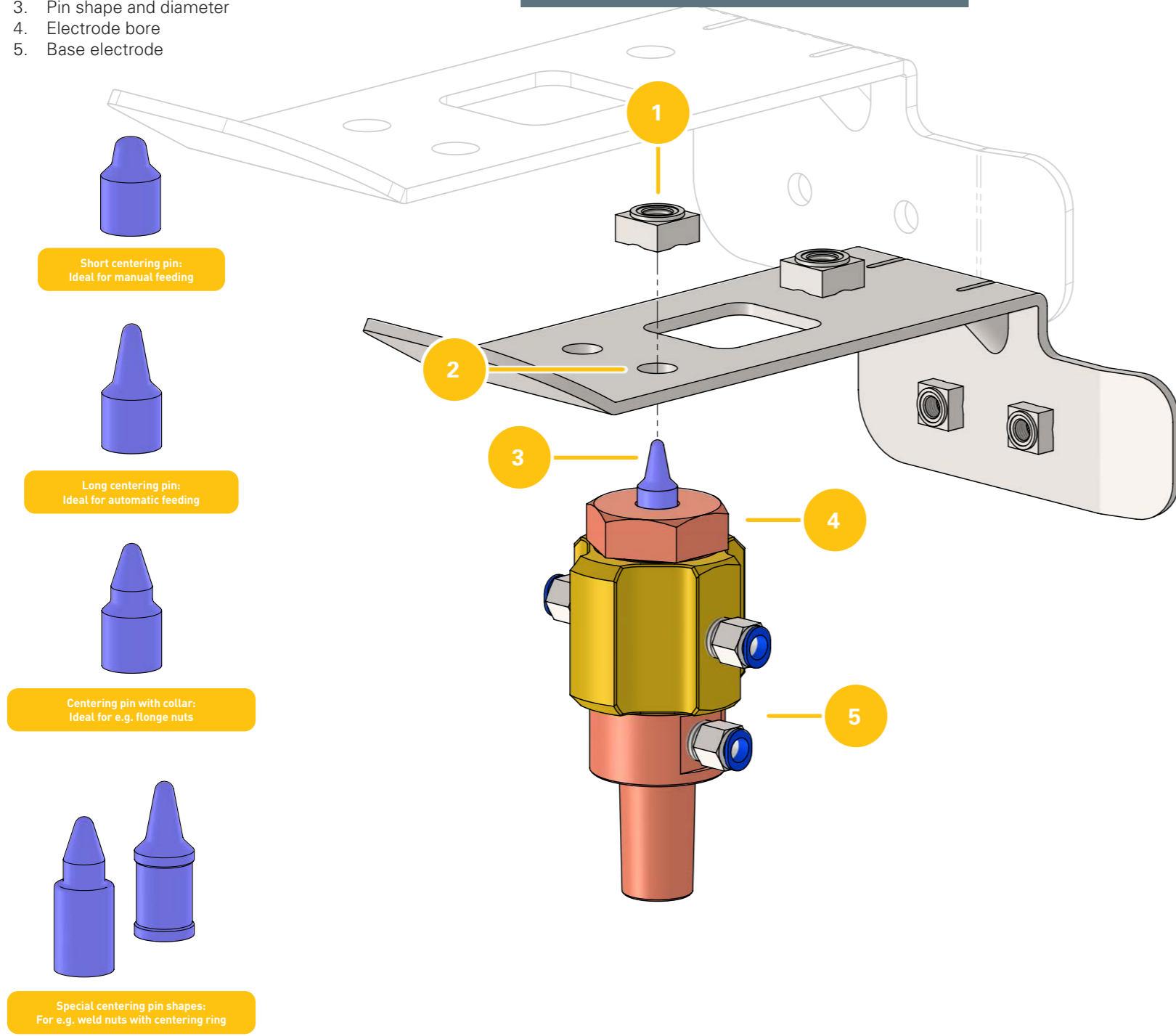
Each lower electrode has been specifically designed to ensure consistently high welding quality, even under extreme conditions. Our full-ceramic centering pins, made of Cerazur or Volcera, provide optimum centering.

This information is used to select the appropriate lower electrode that is assembled:

1. Nut size (nominal thread size)
2. Sheet hole diameter
3. Pin shape and diameter
4. Electrode bore
5. Base electrode

For example, our DOCERAM recommendation:

1. Nut size (nominal thread size): M8
2. Sheet metal hole diameter: 9.5 mm
3. Pin shape and diameter: long, 9.4 mm
4. Electrode bore 9.6 mm
5. Base electrode: water-cooled complete electrode, cone MK2



For high temperatures and long welding times, we rely on Volcera!

VOLCERA:
OUR TEMPERATURE
SHOCK RESISTANT
CERAMIC

COMPLETE ELECTRODE

COOLED AND UNCOOLED

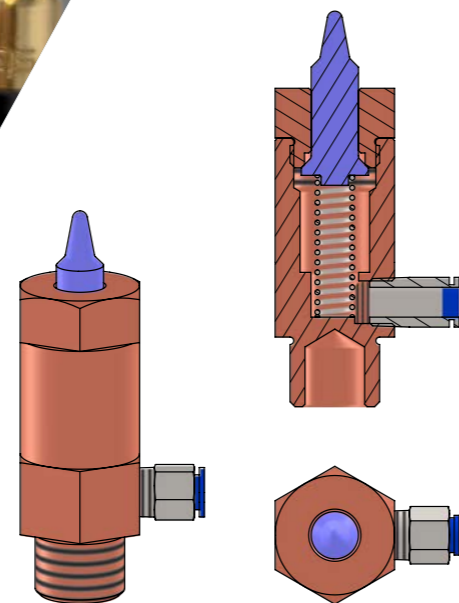
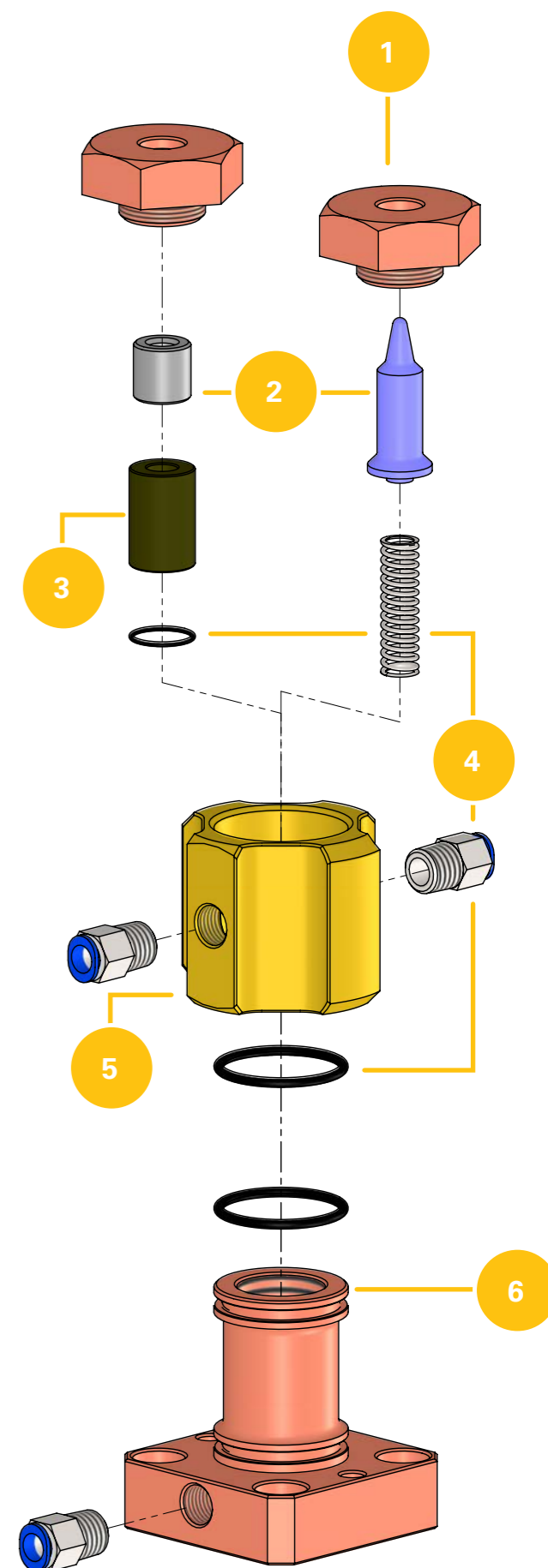
Complete electrodes offer a compact design that enables the production of precise welded joints, even in tight installation spaces.

Our cooled and uncooled complete electrodes are specially designed to withstand high temperatures and mechanical loads, while ensuring reliable centering through full-ceramic centering pins and sleeves.

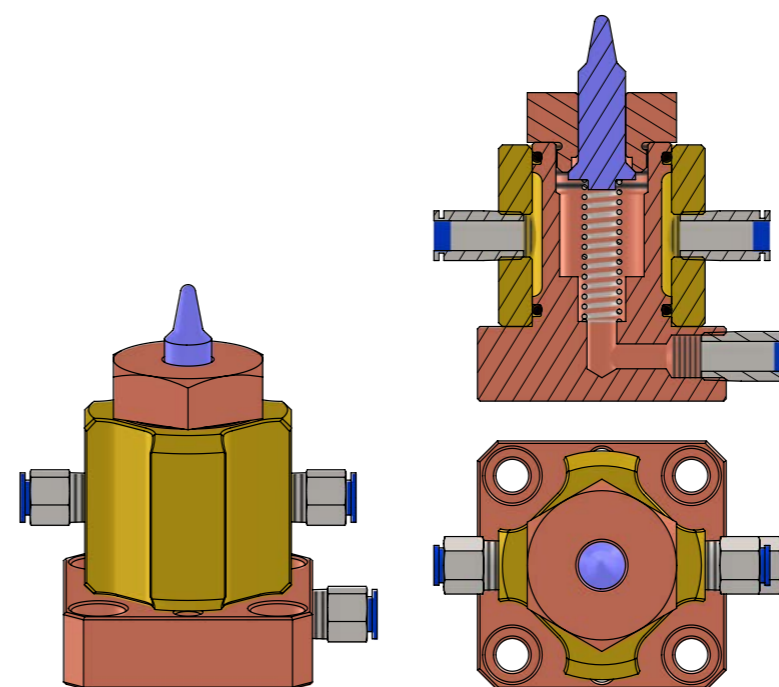
Their versatility and adaptability make them ideal for a variety of applications in industrial production.

Components at a glance:

1. Exchange electrode
2. Centering pin or sleeve made of Cerazur or Volcera
3. Insulating insert made of DOGLAS
4. Cooling ring of the cooled version
5. Accessories such as springs, compressed air connections and O-rings
6. Base electrode



Lower electrode uncooled

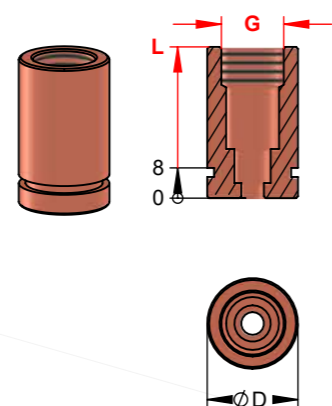


Lower electrode cooled

BASE ELECTRODES UNCOOLED

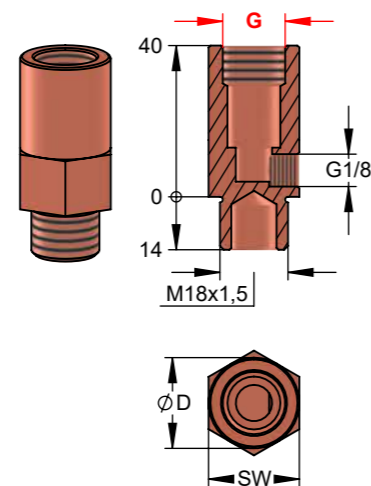
SPIGOT

For Nut	G	L	D	Item No.
M4, M5	M14x1,5	30	18	1111ZK10500
M4, M5	M14x1,5	40	18	1111ZK10501
M4, M5	M14x1,5	50	18	1111ZK10502
M6	M16x1,5	30	18	1111ZK10503
M6	M16x1,5	40	18	1111ZK10504
M6	M16x1,5	50	18	1111ZK10505
M8	M18x1,5	40	24	1111ZK10512
M8	M18x1,5	50	24	1111ZK10513
M8	M18x1,5	60	24	1111ZK10514
M4, M5	M14x1,5	30	24	1111ZK10506
M4, M5	M14x1,5	40	24	1111ZK10507
M4, M5	M14x1,5	50	24	1111ZK10508
M6	M16x1,5	30	24	1111ZK10509
M6	M16x1,5	40	24	1111ZK10510
M6	M16x1,5	50	24	1111ZK10511
M8	M18x1,5	40	28	1111ZK10515
M8	M18x1,5	50	28	1111ZK10516
M8	M18x1,5	60	28	1111ZK10517
M10	M20x1,5	40	28	1111ZK10518
M10	M20x1,5	50	28	1111ZK10519
M10	M20x1,5	60	28	1111ZK10520
M12, 7/16 Zoll UNF	M22x1,5	40	28	1111ZK10521
M12, 7/16 Zoll UNF	M22x1,5	50	28	1111ZK10522
M12, 7/16 Zoll UNF	M22x1,5	60	28	1111ZK10523



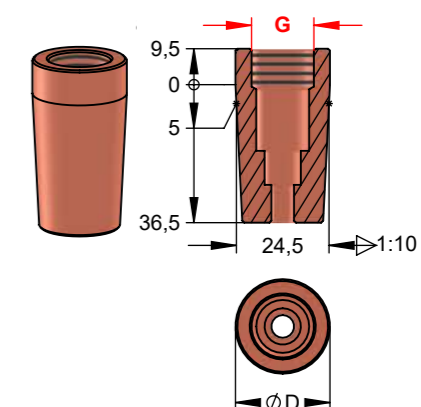
THREAD M18X1.5

For Nut	G	D	SW	Item No.
M4, M5	M14x1,5	19	24	1111ZK10560
M6	M16x1,5	24	24	1111ZK10561
M8	M18x1,5	24	24	1111ZK10562
M10	M20x1,5	27	27	1111ZK10563
M12, 7/16 Zoll UNF	M22x1,5	30	30	1111ZK10564



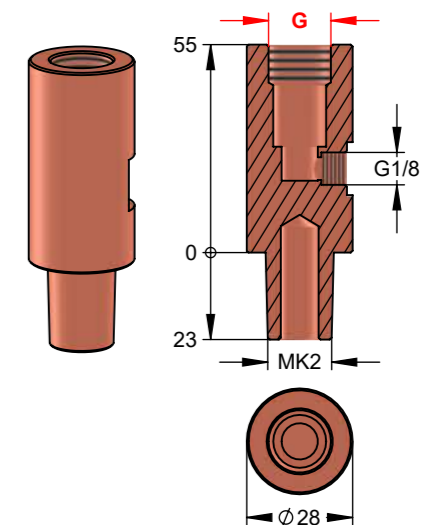
CONE 1:10

For Nut	G	D	Item No.
M4, M5	M14x1,5	25	1111ZK10580
M6	M16x1,5	25	1111ZK10581
M8	M18x1,5	25	1111ZK10582
M10	M20x1,5	30	1111ZK10583
M12, 7/16 Zoll UNF	M22x1,5	30	1111ZK10584



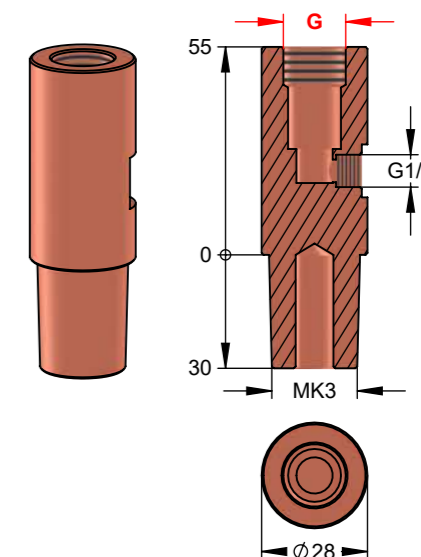
CONE MK2

For Nut	G	Item No.
M4, M5	M14x1,5	1111ZK10540
M6	M16x1,5	1111ZK10541
M8	M18x1,5	1111ZK10542
M10	M20x1,5	1111ZK10544
M12, 7/16 Zoll UNF	M22x1,5	1111ZK10546



CONE MK3

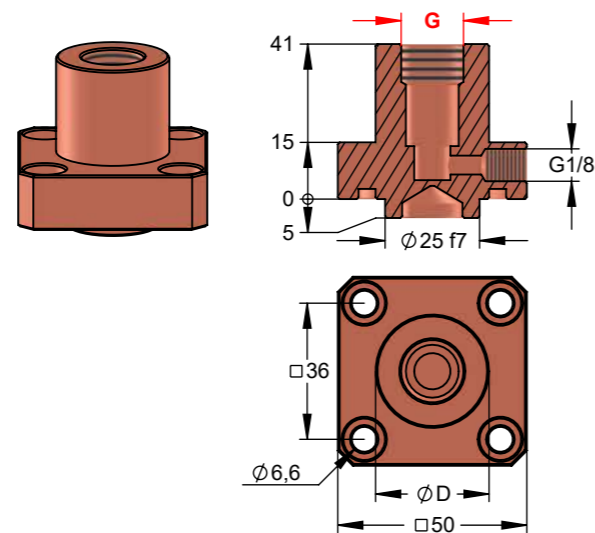
For Nut	G	Item No.
M8	M18x1,5	1111ZK10543
M10	M20x1,5	1111ZK10545
M12, 7/16 Zoll UNF	M22x1,5	1111ZK10547



BASE ELECTRODES COOLED

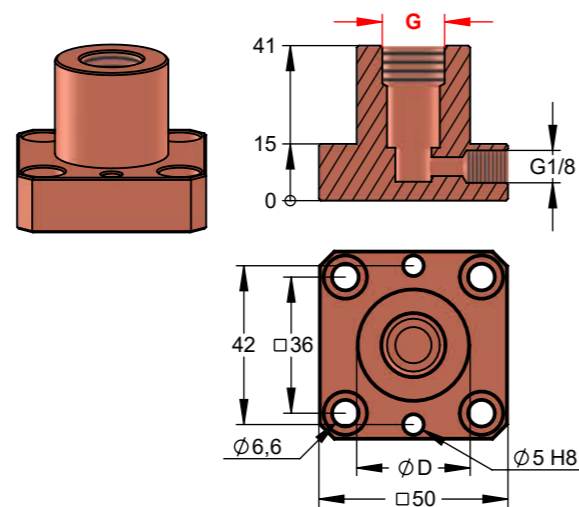
R-TYPE

For Nut	G	D	Item No.
M4, M5	M14x1,5	26	1111ZK10608
M6	M16x1,5	28	1111ZK10611
M8	M18x1,5	30	1111ZK10616
M10	M20x1,5	30	1111ZK10619
M12, 7/16 ZOLL UNF	M22x1,5	30	1111ZK10622



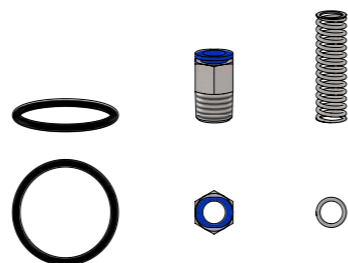
4XM6

For Nut	G	D	Item No.
M4, M5	M14x1,5	25	1111ZK10580
M6	M16x1,5	25	1111ZK10581
M8	M18x1,5	25	1111ZK10582
M10	M20x1,5	30	1111ZK10583
M12, 7/16 Zoll UNF	M22x1,5	30	1111ZK10584



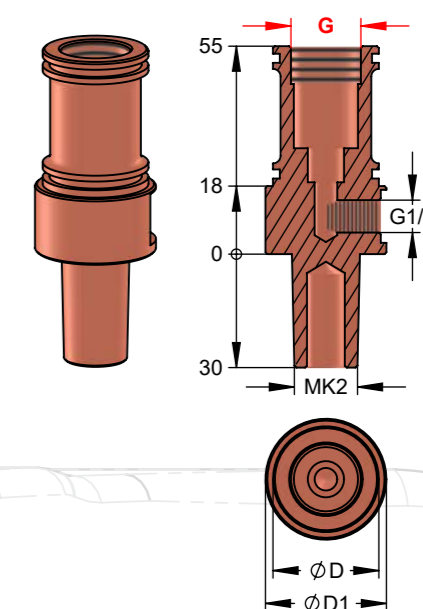
ACCESSORIES BASE ELECTRODES UNCOOLED

Description	Material	Item No.
Spring M4, M5 for base electrodes from 40 mm	1.4310	1112ZK12204
Spring M4 - M6 for base electrodes up to 30 mm	1.4310	1112ZK12205
Spring M6 - M8 for base electrodes from 40 mm	1.4310	1112ZK12206
Spring M10 - M12, 7/16 inch UNF for base electrodes from 40 mm	1.4310	1112ZK12207
O-rings $\phi 14 \times 2$ mm for M4 - M6	NBR 70	1123ZK16434
O-rings $\phi 20 \times 2$ mm for M4 - M6	NBR 70	1123ZK16435
O-rings $\phi 24 \times 2$ mm for M8 - M12, 7/16 inch UNF	NBR 70	1123ZK16436
O-rings $\phi 30 \times 2$ mm for base electrode 34	NBR 70	1123ZK26187
O-rings $\phi 12 \times 1$ mm for stud insert M4 - M6	NBR 70	1123ZK16437
O-rings $\phi 17 \times 1$ mm for stud insert M8 - M12	NBR 70	1123ZK16438
Hose connection G1/8 for 6 mm hose	-	1116ZK12353



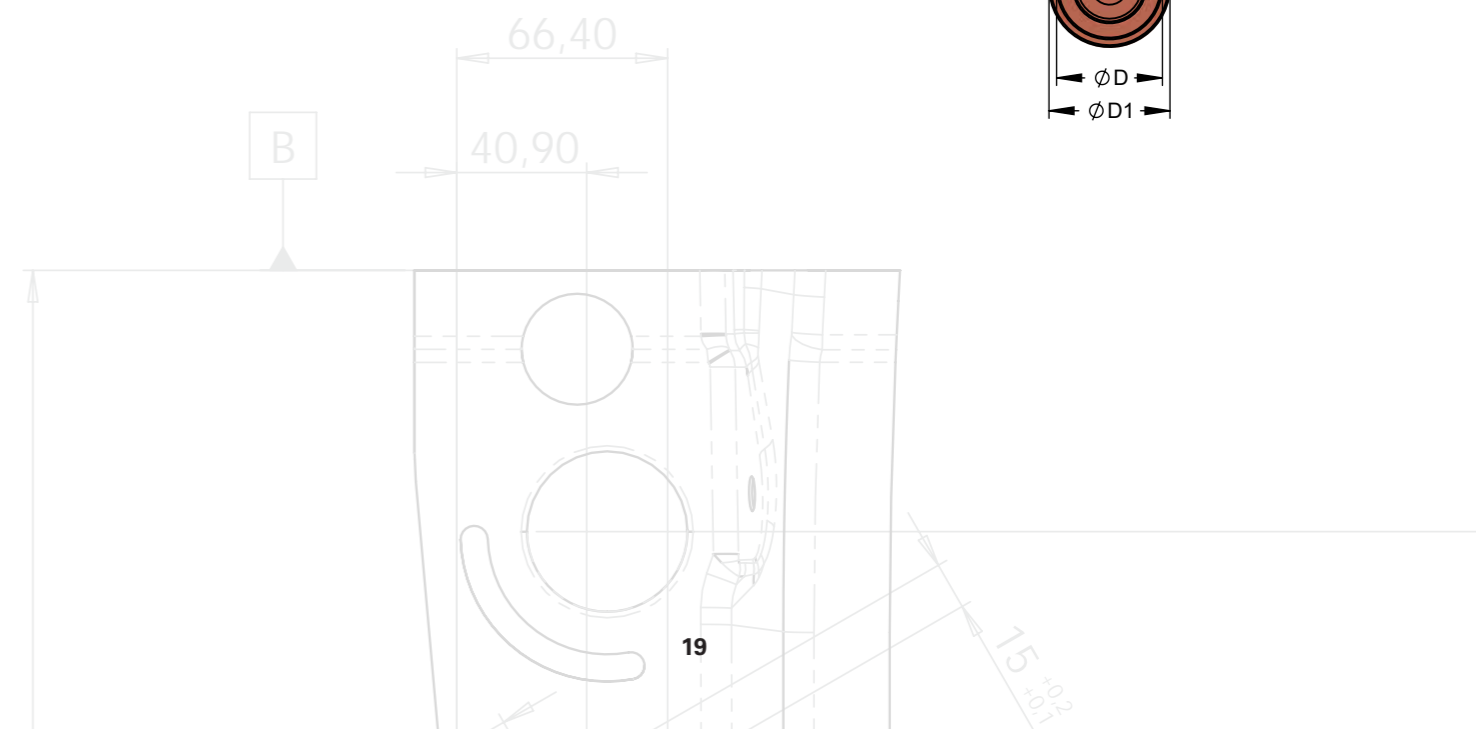
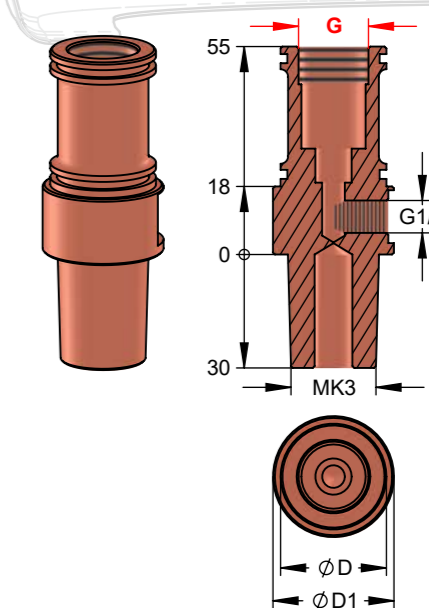
CONE MK2

For Nut	G	D	D1	Item No.
M4, M5, M6, M8	M20x1,5	28	32	1111ZK20542
M10, M12	M26x1,5	34	36	1111ZK20544
M14, M16	M30x1,5	40	44	1111ZK20566



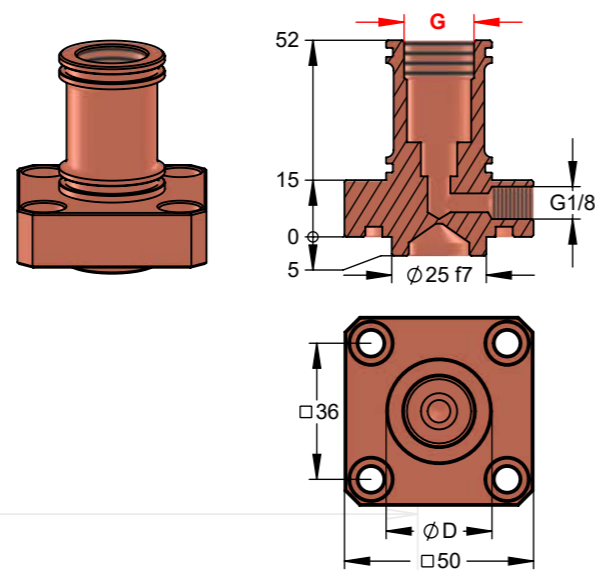
CONE MK3

For Nut	G	D	D1	Item No.
M4, M5, M6, M8	M20x1,5	28	32	1111ZK20543
M10, M12	M26x1,5	34	36	1111ZK20545
M14, M16	M30x1,5	40	44	1111ZK20567



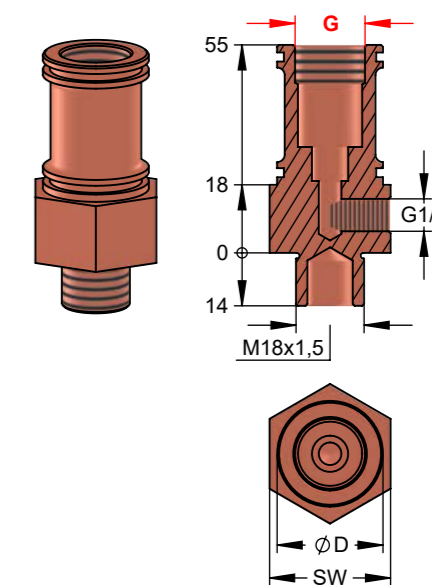
R-TYPE

For Nut	G	D	Item No.
M4, M5, M6, M8	M20x1,5	28	1111ZK20642
M10, M12	M26x1,5	34	1111ZK20644

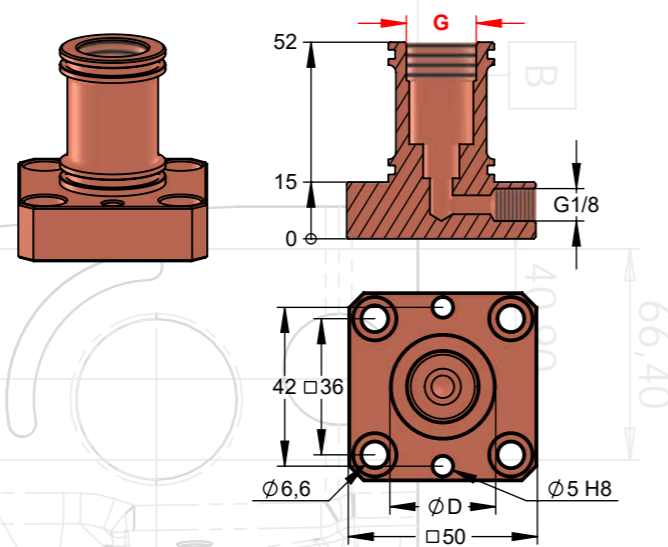


THREAD M18X1.5

For Nut	G	D	SW	Item No.
M4, M5, M6, M8	M20x1,5	28	32	1111ZK20562
M10, M12	M26x1,5	34	36	1111ZK20563
M14, M16	M30x1,5	40	41	1111ZK20565



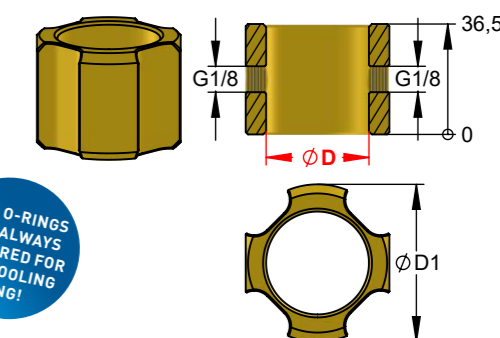
For Nut	G	D	Item No.
M4, M5, M6, M8	M20x1,5	28	1111301553
M10, M12	M26x1,5	34	1111301554



COOLING RING

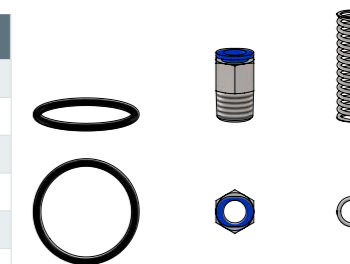
For Nut	D	D1	Cooling ring (2.0401)
M4, M5, M6, M8	28	46	1113ZK19766
M10, M12	34	52	1113ZK19767
M14, M16	40	65	1113ZK19770

O-ring (NBR 70)
1123ZK16436
1123ZK26187
1123Z77089



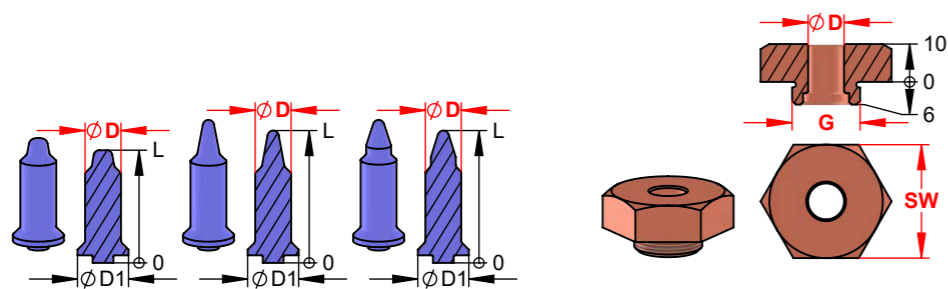
ACCESSORIES

Description	Material	Item No.
Spring M4, M5 for base electrodes from 40 mm	1.4310	1112ZK12204
Spring M4 - M6 for base electrodes up to 30 mm	1.4310	1112ZK12205
Spring M6 - M8 for base electrodes from 40 mm	1.4310	1112ZK12206
Spring M10 - M12, 7/16 inch UNF for base electrodes from 40 mm	1.4310	1112ZK12207
O-rings $\phi 14 \times 2$ mm for M4 - M6	NBR 70	1123ZK16434
O-rings $\phi 20 \times 2$ mm for M4 - M6	NBR 70	1123ZK16435
O-rings $\phi 24 \times 2$ mm for M8 - M12, 7/16 inch UNF	NBR 70	1123ZK16436
O-rings $\phi 36 \times 2$ mm for M14 - 16	NBR 70	1123Z77089
O-rings $\phi 30 \times 2$ mm for base electrode 34	NBR 70	1123ZK26187
O-rings $\phi 12 \times 1$ mm for bolt insert M4 - M6	NBR 70	1123ZK16437
O-rings $\phi 17 \times 1$ mm for bolt insert M8 - M12	NBR 70	1123ZK16438
Hose connection G1/8 for 6 mm hose	-	1116ZK12353



CENTERING PINS

CENTERING PINS FOR WELD NUT M4



Ø sheet	D _{0,1} ^{-0,05}	Cerazur centering pin					
		short		long		with collar	
		L	D1	L	D1	L	D1
		26,5	10	31	10	31	10
4,5							
4,6	4,5	8228ZK11000		8228ZK10000		8228ZK10300	
4,7	4,6	8228ZK11001		8228ZK10001		8228ZK10301	
4,8	4,7	8228ZK11002		8228ZK10002		8228ZK10302	
4,9	4,8	8228ZK11003		8228ZK10003		8228ZK10303	
5	4,9	8228ZK11004		8228ZK10004		8228ZK10304	
5,1	5	8228ZK11005		8228ZK10005		8228ZK10305	
5,2	5,1	8228ZK11006		8228ZK10006		8228ZK10306	
5,3	5,2	8228ZK11007		8228ZK10007		8228ZK10307	
5,4	5,3	8228ZK11008		8228ZK10008		8228ZK10308	
5,5	5,4	8228ZK11009		8228ZK10009		8228ZK10309	
5,6	5,5	8228ZK11010		8228ZK10010		8228ZK10310	
5,7	5,6	8228ZK11011		8228ZK10011		8228ZK10311	
5,8	5,7	8228ZK11012		8228ZK10012		8228ZK10312	
5,9	5,8	8228ZK11013		8228ZK10013		8228ZK10313	
6	5,9	8228ZK11014		8228ZK10014		8228ZK10314	
5,8	6	8228ZK11015		8228ZK10015		8228ZK10315	
5,9	5,8						
6	5,9						
6,1	6						

D _{0,1} ^{+0,1}	Exchange electrode			
	uncooled		cooled	
	G	SW	G	SW
	M14x1,5	19	M20x1,5	30
4,5	1111ZK10000		1111ZK20000	
4,6	1111ZK10001		1111ZK20001	
4,7	1111ZK10002		1111ZK20002	
4,8	1111ZK10003		1111ZK20003	
4,9	1111ZK10004		1111ZK20004	
5	1111ZK10005		1111ZK20005	
5,1	1111ZK10006		1111ZK20006	
5,2	1111ZK10007		1111ZK20007	
5,3	1111ZK10008		1111ZK20008	
5,4	1111ZK10009		1111ZK20009	
5,5	1111ZK10010		1111ZK20010	
5,6	1111ZK10011		1111ZK20011	
5,7	1111ZK10012		1111ZK20012	
5,8	1111ZK10013		1111ZK20013	
5,9	1111ZK10014		1111ZK20014	
6	1111ZK10015		1111ZK20015	
6,1	1111ZK10016		1111ZK20016	
6,2	1111ZK10017		1111ZK20017	
6,3	1111ZK10018		1111ZK20018	
6,4	1111ZK10019		1111ZK20019	
6,5	1111ZK10020		1111ZK20020	

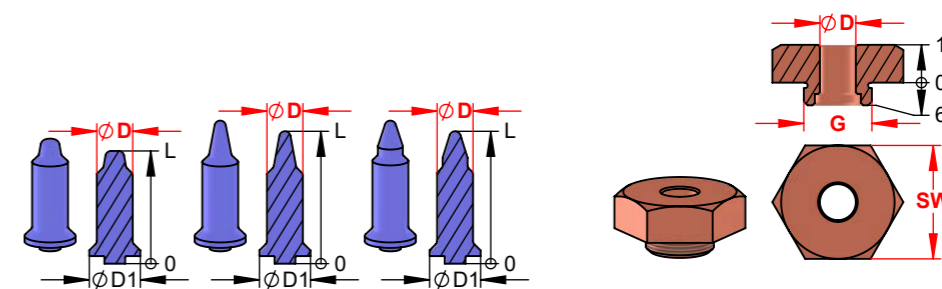
Selection of centering pin and electrode according to DOCERAM recommendation:

Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZK with 8440ZK.

All electrodes are also available in material 2.1285. When ordering, replace the prefix 1111ZK with 1120ZK.

CENTERING PINS FOR WELD NUT M5



Ø sheet	D _{0,1} ^{-0,05}	Cerazur centering pin					
		short		long		with collar	
		L	D1	L	D1	L	D1
		26,5	10	31	10	31	10
5,6	5,5	8228ZK11016		8228ZK10016		8228ZK10316	
5,7	5,6	8228ZK11017		8228ZK10017		8228ZK10317	
5,8	5,7	8228ZK11018		8228ZK10018		8228ZK10318	
5,9	5,8	8228ZK11019		8228ZK10019		8228ZK10319	
6	5,9	8228ZK11020		8228ZK10020		8228ZK10320	
6,1	6	8228ZK11021		8228ZK10021		8228ZK10321	
6,2	6,1	8228ZK11022		8228ZK10022		8228ZK10322	
6,3	6,2	8228ZK11023		8228ZK10023		8228ZK10323	
6,4	6,3	8228ZK11024		8228ZK10024		8228ZK10324	
6,5	6,4	8228ZK11025		8228ZK10025		8228ZK10325	
6,6	6,5	8228ZK11026		8228ZK10026		8228ZK10326	
6,7	6,6	8228ZK11027		8228ZK10027		8228ZK10327	
6,8	6,7	8228ZK11028		8228ZK10028		8228ZK10328	
6,9	6,8	8228ZK11029		8228ZK10029		8228ZK10329	
7	6,9	8228ZK11030		8228ZK10030		8228ZK10330	
7,1	7	8228ZK11031		8228ZK10031		8228ZK10331	

D _{0,1} ^{+0,1}	Exchange electrode					
	uncooled		cooled		cooled	
	G	SW	G	SW	G	SW
	M14x1,5	19	M14x1,5	24	M20x1,5	30
5,5	1111ZK10010		1111ZK10057		1111ZK20010	
5,6	1111ZK10011		1111ZK10058		1111ZK20011	
5,7	1111ZK10012		1111ZK10059		1111ZK20012	
5,8	1111ZK10013		1111ZK10060		1111ZK20013	
5,9	1111ZK10014		1111ZK10061		1111ZK20014	
6	1111ZK10015		1111ZK10062		1111ZK20015	
6,1	1111ZK10016		1111ZK10063		1111ZK20016	
6,2	1111ZK10017		1111ZK10064		1111ZK20017	
6,3	1111ZK10018		1111ZK10065		1111ZK20018	
6,4	1111ZK10019		1111ZK10066		1111ZK20019	
6,5	1111ZK10020		1111ZK10067		1111ZK20020	
6,6	1111ZK10021		1111ZK10068		1111ZK20021	
6,7	1111ZK10022		1111ZK10069		1111ZK20022	
6,8	1111ZK10023		1111ZK10070		1111ZK20023	
6,9	1111ZK10024		1111ZK10071		1111ZK20024	
7	1111ZK10025		1111ZK10072		1111ZK20025	
7,1	1111ZK10026		1111ZK10073		1111ZK20026	
7,2	1111ZK10027		1111ZK10074		1111ZK20027	
7,3	1111ZK10028		1111ZK10075		1111ZK20028	
7,4	1111ZK10029		1111ZK10076		1111ZK20029	
7,5	1111ZK10030		1111ZK10077		1111ZK20030	

Selection of centering pin and electrode according to DOCERAM recommendation:

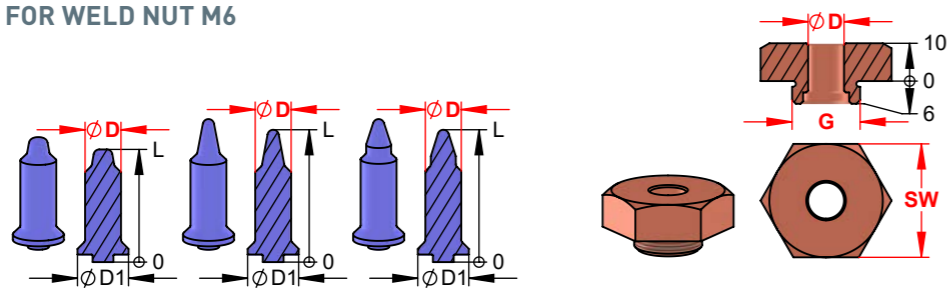
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZK with 8440ZK.

All electrodes are also available in material 2.1285. When ordering, replace the prefix 1111ZK with 1120ZK.



CENTERING PINS FOR WELD NUT M6



Ø sheet	Cerazur centering pin						
	D _{0,1} ^{-0,05}	short		long		with collar	
		L	D1	L	D1	L	D1
		275	11,5	34	11,5	34	11,5
6,6	6,5	8228ZK11032		8228ZK10032		8228ZK10332	
6,7	6,6	8228ZK11033		8228ZK10033		8228ZK10333	
6,8	6,7	8228ZK11034		8228ZK10034		8228ZK10334	
6,9	6,8	8228ZK11035		8228ZK10035		8228ZK10335	
7	6,9	8228ZK11036		8228ZK10036		8228ZK10336	
7,1	7	8228ZK11037		8228ZK10037		8228ZK10337	
7,2	7,1	8228ZK11038		8228ZK10038		8228ZK10338	
7,3	7,2	8228ZK11039		8228ZK10039		8228ZK10339	
7,4	7,3	8228ZK11040		8228ZK10040		8228ZK10340	
7,5	7,4	8228ZK11041		8228ZK10041		8228ZK10341	
7,6	7,5	8228ZK11042		8228ZK10042		8228ZK10342	
7,7	7,6	8228ZK11043		8228ZK10043		8228ZK10343	
7,8	7,7	8228ZK11044		8228ZK10044		8228ZK10344	
7,9	7,8	8228ZK11045		8228ZK10045		8228ZK10345	
8	7,9	8228ZK11046		8228ZK10046		8228ZK10346	
8,1	8	8228ZK11047		8228ZK10047		8228ZK10347	
8,2	8,1	8228ZK11048		8228ZK10048		8228ZK10348	
8,3	8,2	8228ZK11049		8228ZK10049		8228ZK10349	
8,4	8,3	8228ZK11050		8228ZK10050		8228ZK10350	
8,5	8,4	8228ZK11051		8228ZK10051		8228ZK10351	
8,6	8,5	8228ZK11052		8228ZK10052		8228ZK10352	

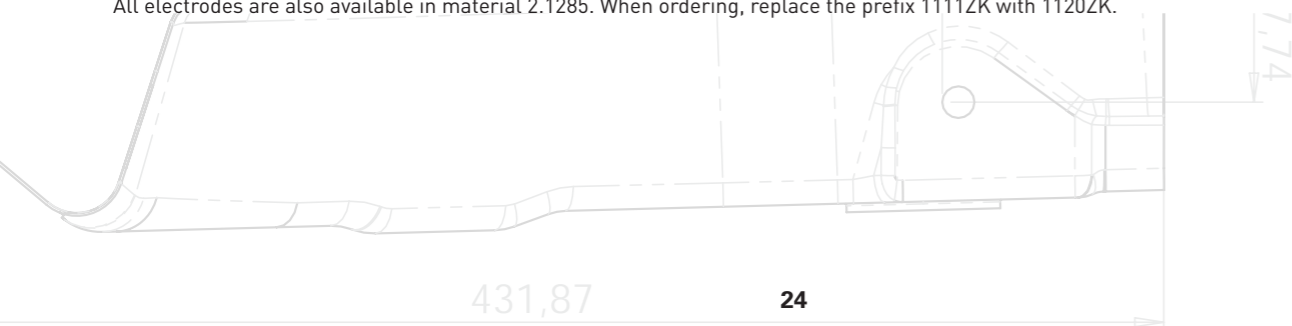
D _{0,1} ^{+0,1}	Exchange electrode					
	uncooled		cooled			
	G	SW	G	SW	G	SW
	M16x1,5	19	M16x1,5	24	M20x1,5	30
6,5	1111ZK10031		1111ZK10078		1111ZK20031	
6,6	1111ZK10032		1111ZK10079		1111ZK20032	
6,7	1111ZK10033		1111ZK10080		1111ZK20033	
6,8	1111ZK10034		1111ZK10081		1111ZK20034	
6,9	1111ZK10035		1111ZK10082		1111ZK20035	
7	1111ZK10036		1111ZK10083		1111ZK20036	
7,1	1111ZK10037		1111ZK10084		1111ZK20037	
7,2	1111ZK10038		1111ZK10085		1111ZK20038	
7,3	1111ZK10039		1111ZK10086		1111ZK20039	
7,4	1111ZK10040		1111ZK10087		1111ZK20040	
7,5	1111ZK10041		1111ZK10088		1111ZK20041	
7,6	1111ZK10042		1111ZK10089		1111ZK20042	
7,7	1111ZK10043		1111ZK10090		1111ZK20043	
7,8	1111ZK10044		1111ZK10091		1111ZK20044	
7,9	1111ZK10045		1111ZK10092		1111ZK20045	
8	1111ZK10046		1111ZK10093		1111ZK20046	
8,1	1111ZK10047		1111ZK10094		1111ZK20047	
8,2	1111ZK10048		1111ZK10095		1111ZK20048	
8,3	1111ZK10049		1111ZK10096		1111ZK20049	
8,4	1111ZK10050		1111ZK10097		1111ZK20050	
8,5	1111ZK10051		1111ZK10098		1111ZK20051	
8,6	1111ZK10052		1111ZK10099		1111ZK20052	
8,7	1111ZK10053		1111ZK10100		1111ZK20053	
8,8	1111ZK10054		1111ZK10101		1111ZK20054	
8,9	1111ZK10055		1111ZK10102		1111ZK20055	
9	1111ZK10056		1111ZK10103		1111ZK20056	

Selection of centering pin and electrode according to DOCERAM recommendation:

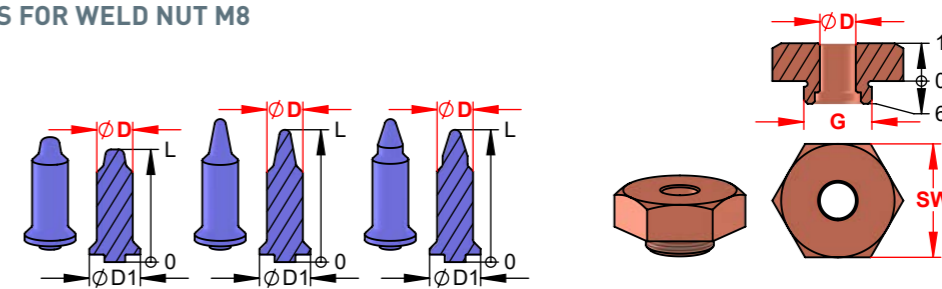
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZK with 8440ZK.

All electrodes are also available in material 2.1285. When ordering, replace the prefix 1111ZK with 1120ZK.



CENTERING PINS FOR WELD NUT M8



Ø sheet	Cerazur centering pin						
	D _{0,1} ^{-0,05}	short		long		with collar	
		L	D1	L	D1	L	D1
		29,8	13,5	35	13,5	35	13,5
8,6	8,5	8228ZK11053		8228ZK10053		8228ZK10353	
8,7	8,6	8228ZK11054		8228ZK10054		8228ZK10354	
8,8	8,7	8228ZK11055		8228ZK10055		8228ZK10355	
8,9	8,8	8228ZK11056		8228ZK10056		8228ZK10356	
9	8,9	8228ZK11057		8228ZK10057		8228ZK10357	
9,1	9	8228ZK11058		8228ZK10058		8228ZK10358	
9,2	9,1	8228ZK11059		8228ZK10059		8228ZK10359	
9,3	9,2	8228ZK11060		8228ZK10060		8228ZK10360	
9,4	9,3	8228ZK11061		8228ZK10061		8228ZK10361	
9,5	9,4	8228ZK11062		8228ZK10062		8228ZK10362	
9,6	9,5	8228ZK11063		8228ZK10063		8228ZK10363	
9,7	9,6	8228ZK11064		8228ZK10064		8228ZK10364	
9,8	9,7	8228ZK11065		8228ZK10065		8228ZK10365	
9,9	9,8	8228ZK11066		8228ZK10066		8228ZK10366	
10	9,9	8228ZK11067		8228ZK10067		8228ZK10367	
10,1	10	8228ZK11068		8228ZK10068		8228ZK10368	
10,2	10,1	8228ZK11069		8228ZK10069		8228ZK10369	
10,3	10,2	8228ZK11070		8228ZK10070		8228ZK10370	
10,4	10,3	8228ZK11071		8228ZK10071		8228ZK10371	
10,5	10,4	8228ZK11072		8228ZK10072		8228ZK10372	
10,6	10,5	8228ZK11073		8228ZK10073		8228ZK10373	
10,7	10,6	8228ZK11074		8228ZK10074		8228ZK10374	
10,8	10,7	8228ZK11075		8228ZK10075		8228ZK10375	
10,9	10,8	8228ZK11076		8228ZK10076		8228ZK10376	
11	10,9	8228ZK11077		8228ZK10077		8228ZK10377	
11,1	11	8228ZK11078		8228ZK10078		8228ZK10378	

D _{0,1} ^{+0,1}	Exchange electrode					
	uncooled		cooled			
	G	SW	G	SW	G	SW
	M18x1,5	24	M18x1,5	30	M20x1,5	30
8,5	1111ZK10104		1111ZK10135		1111ZK20104	
8,6	1111ZK10105		1111ZK10136		1111ZK20105	
8,7	1111ZK10106		1111ZK10137		1111ZK20106	
8,8	1111ZK10107		1111ZK10138		1111ZK20107	
8,9	1111ZK10108		1111ZK10139		1111ZK20108	
9	1111ZK10109		1111ZK10140		1111ZK20109	
9,1	1111ZK10110		1111ZK10141		1111ZK20110	
9,2	1111ZK10111		1111ZK10142		1111ZK20111	
9,3	1111ZK10112		1111ZK10143		1111ZK20112	
9,4	1111ZK10113		1111ZK10144		1111ZK20113	
9,5	1111ZK10114		1111ZK10145		1111ZK20114	
9,6	1111ZK10115		1111ZK10146		1111ZK20115	
9,7	1111ZK10116		1111ZK10147		1111ZK20116	
9,8	1111ZK10117		1111ZK10148		1111ZK20117	
9,9	1111ZK10118		1111ZK10149		1111ZK20118	
10	1111ZK10119		1111ZK10150		1111ZK20119	
10,1	1111ZK10120		1111ZK10151		1111ZK20120	
10,2	1111ZK10121		1111ZK10152		1111ZK20121	
10,3	1111ZK10122		1111ZK10153		1111ZK20122	
10,4	1111ZK10123		1111ZK10154		1111ZK20123	
10,5	1111ZK10124		1111ZK10155		1111ZK20124	
10,6	1111ZK10125		1111ZK10156		1111ZK20125	
10,7	1111ZK10126		1111ZK10157		1111ZK20126	
10,8	1111ZK10127		1111ZK10158		1111ZK20127	
10,9	1111ZK10128		1111ZK10159		1111ZK20128	
11	1111ZK10129		1111ZK10160		1111ZK20129	
11,1	1111ZK10130		1111ZK10161		1111ZK20130	
11,2	1111ZK10131		1111ZK10162		1111ZK20131	
11,3	1111ZK10132		1111ZK10163		1111ZK20132	
11,4	1111ZK10133		1111ZK10164		1111ZK20133	
11,5	1111ZK10134		1111ZK10165		1111ZK20134	

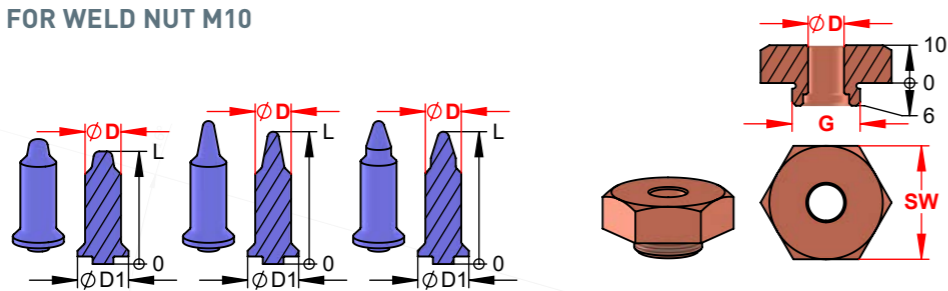
Selection of centering pin and electrode according to DOCERAM recommendation:

Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZK with 8440ZK.

All electrodes are also available in material 2.1285. When ordering, replace the prefix 1111ZK with 1120ZK.

CENTERING PINS FOR WELD NUT M10



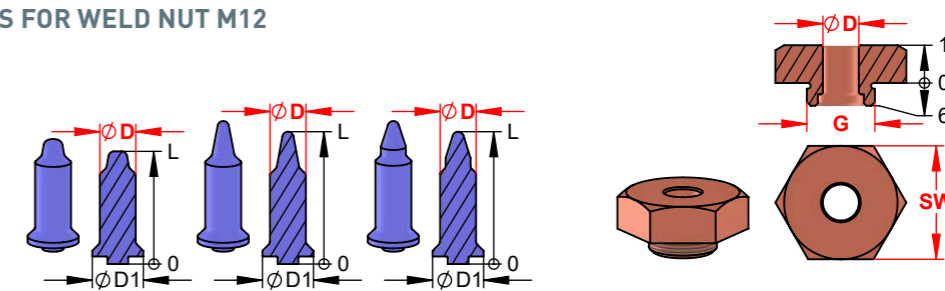
Ø sheet	D _{0,1} ^{-0,05}	Cerazur centering pin						Exchange electrode			
		short		long		with collar		uncooled		cooled	
		L	D1	L	D1	L	D1	G	SW	G	SW
		32,3	16	40	16	40	16	M20X1,5	30	M26X1,5	36
11,1	11	8228ZK11079		8228ZK10079		8228ZK10379		1111ZK10166		1111ZK20166	
11,2	11,1	8228ZK11080		8228ZK10080		8228ZK10380		1111ZK10167		1111ZK20167	
11,3	11,2	8228ZK11081		8228ZK10081		8228ZK10381		1111ZK10168		1111ZK20168	
11,4	11,3	8228ZK11082		8228ZK10082		8228ZK10382		1111ZK10169		1111ZK20169	
11,5	11,4	8228ZK11083		8228ZK10083		8228ZK10383		1111ZK10170		1111ZK20170	
11,6	11,5	8228ZK11084		8228ZK10084		8228ZK10384		1111ZK10171		1111ZK20171	
11,7	11,6	8228ZK11085		8228ZK10085		8228ZK10385		1111ZK10172		1111ZK20172	
11,8	11,7	8228ZK11086		8228ZK10086		8228ZK10386		1111ZK10173		1111ZK20173	
11,9	11,8	8228ZK11087		8228ZK10087		8228ZK10387		1111ZK10174		1111ZK20174	
12	11,9	8228ZK11088		8228ZK10088		8228ZK10388		1111ZK10175		1111ZK20175	
12,1	12	8228ZK11089		8228ZK10089		8228ZK10389		1111ZK10176		1111ZK20176	
12,2	12,1	8228ZK11090		8228ZK10090		8228ZK10390		1111ZK10177		1111ZK20177	
12,3	12,2	8228ZK11091		8228ZK10091		8228ZK10391		1111ZK10178		1111ZK20178	
12,4	12,3	8228ZK11092		8228ZK10092		8228ZK10392		1111ZK10179		1111ZK20179	
12,5	12,4	8228ZK11093		8228ZK10093		8228ZK10393		1111ZK10180		1111ZK20180	
12,6	12,5	8228ZK11094		8228ZK10094		8228ZK10394		1111ZK10181		1111ZK20181	
12,7	12,6	8228ZK11095		8228ZK10095		8228ZK10395		1111ZK10182		1111ZK20182	
12,8	12,7	8228ZK11096		8228ZK10096		8228ZK10396		1111ZK10183		1111ZK20183	
12,9	12,8	8228ZK11097		8228ZK10097		8228ZK10397		1111ZK10184		1111ZK20184	
13	12,9	8228ZK11098		8228ZK10098		8228ZK10398		1111ZK10185		1111ZK20185	
13,1	13	8228ZK11099		8228ZK10099		8228ZK10399		1111ZK10186		1111ZK20186	
								1111ZK10187		1111ZK20187	
								1111ZK10188		1111ZK20188	
								1111ZK10189		1111ZK20189	
								1111ZK10190		1111ZK20190	
								1111ZK10191		1111ZK20191	

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZK with 8440ZK.

All electrodes are also available in material 2.1285. When ordering, replace the prefix 1111ZK with 1120ZK.

CENTERING PINS FOR WELD NUT M12



Ø sheet	D _{0,1} ^{-0,05}	Cerazur centering pin						Exchange electrode			
		short		long		with collar		uncooled		cooled	
		L	D1	L	D1	L	D1	G	SW	G	SW
		34,1	18	43	18	43	18	M22x1,5	30	M26x1,5	36
13,1	13	8228ZK11100		8228ZK10100		8228ZK10400		1111ZK10192		1111ZK20192	
13,2	13,1	8228ZK11101		8228ZK10101		8228ZK10401		1111ZK10193		1111ZK20193	
13,3	13,2	8228ZK11102		8228ZK10102		8228ZK10402		1111ZK10194		1111ZK20194	
13,4	13,3	8228ZK11103		8228ZK10103		8228ZK10403		1111ZK10195		1111ZK20195	
13,5	13,4	8228ZK11104		8228ZK10104		8228ZK10404		1111ZK10196		1111ZK20196	
13,6	13,5	8228ZK11105		8228ZK10105		8228ZK10405		1111ZK10197		1111ZK20197	
13,7	13,6	8228ZK11106		8228ZK10106		8228ZK10406		1111ZK10198		1111ZK20198	
13,8	13,7	8228ZK11107		8228ZK10107		8228ZK10407		1111ZK10199		1111ZK20199	
13,9	13,8	8228ZK11108		8228ZK10108		8228ZK10408		1111ZK10200		1111ZK20200	
14	13,9	8228ZK11109		8228ZK10109		8228ZK10409		1111ZK10201		1111ZK20201	
14,1	14	8228ZK11110		8228ZK10110		8228ZK10410		1111ZK10202		1111ZK20202	
14,2	14,1	8228ZK11111		8228ZK10111		8228ZK10411		1111ZK10203		1111ZK20203	
14,3	14,2	8228ZK11112		8228ZK10112		8228ZK10412		1111ZK10204		1111ZK20204	
14,4	14,3	8228ZK11113		8228ZK10113		8228ZK10413		1111ZK10205		1111ZK20205	
14,5	14,4	8228ZK11114		8228ZK10114		8228ZK10414		1111ZK10206		1111ZK20206	
14,6	14,5	8228ZK11115		8228ZK10115		8228ZK10415		1111ZK10207		1111ZK20207	
14,7	14,6	8228ZK11116		8228ZK10116		8228ZK10416		1111ZK10208		1111ZK20208	
14,8	14,7	8228ZK11117		8228ZK10117		8228ZK10417		1111ZK10209		1111ZK20209	
14,9	14,8	8228ZK11118		8228ZK10118		8228ZK10418		1111ZK10210		1111ZK20210	
15	14,9	8228ZK11119		8228ZK10119		8228ZK10419		1111ZK10211		1111ZK20211	
15,1	15	8228ZK11120		8228ZK10120		8228ZK10420		1111ZK10212		1111ZK20212	
								1111ZK10213		1111ZK20213	
								1111ZK10214		1111ZK20214	
								1111ZK10215		1111ZK20215	
								1111ZK10216		1111ZK20216	
								1111ZK10217		1111ZK20217	

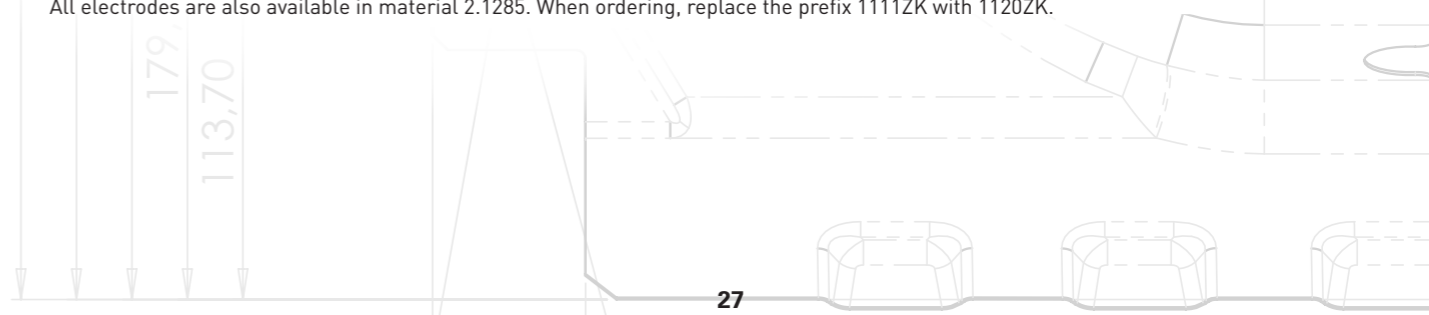
Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZK with 8440ZK.

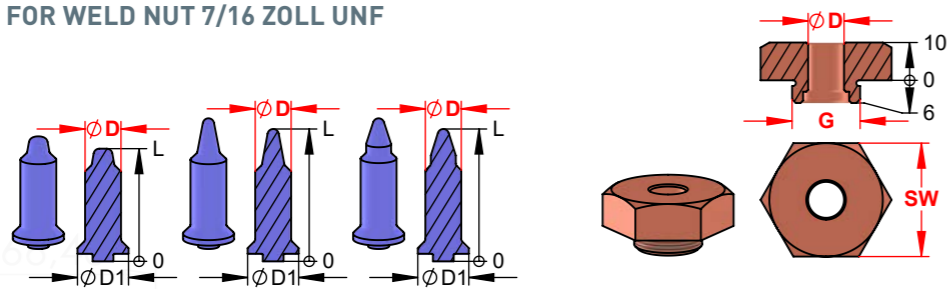
All electrodes are also available in material 2.1285. When ordering, replace the prefix 1111ZK with 1120ZK.

428,70

346,42



CENTERING PINS FOR WELD NUT 7/16 Zoll UNF



Ø sheet	D _{0,05} ^{-0,1}	Cerazur centering pin					
		short		long		with collar	
		L	D1	L	D1	L	D1
		33,5	18	41,5	18	41,5	18
12,1	12	8228ZK17189		8228ZK17089		8228ZK17389	
12,2	12,1	8228ZK17190		8228ZK17090		8228ZK17390	
12,3	12,2	8228ZK17191		8228ZK17091		8228ZK17391	
12,4	12,3	8228ZK17192		8228ZK17092		8228ZK17392	
12,5	12,4	8228ZK17193		8228ZK17093		8228ZK17393	
12,6	12,5	8228ZK17194		8228ZK17094		8228ZK17394	
12,7	12,6	8228ZK17195		8228ZK17095		8228ZK17395	
12,8	12,7	8228ZK17196		8228ZK17096		8228ZK17396	
12,9	12,8	8228ZK17197		8228ZK17097		8228ZK17397	
13	12,9	8228ZK17198		8228ZK17098		8228ZK17398	
13,1	13	8228ZK17199		8228ZK17099		8228ZK17399	
13,2	13,1	8228ZK17200		8228ZK17100		8228ZK17400	
13,3	13,2	8228ZK17201		8228ZK17101		8228ZK17401	
13,4	13,3	8228ZK17202		8228ZK17102		8228ZK17402	
13,5	13,4	8228ZK17203		8228ZK17103		8228ZK17403	
13,6	13,5	8228ZK17204		8228ZK17104		8228ZK17404	
13,7	13,6	8228ZK17205		8228ZK17105		8228ZK17405	
13,8	13,7	8228ZK17206		8228ZK17106		8228ZK17406	
13,9	13,8	8228ZK17207		8228ZK17107		8228ZK17407	
14	13,9	8228ZK17208		8228ZK17108		8228ZK17408	
14,1	14	8228ZK17209		8228ZK17109		8228ZK17409	
14,2	14,1	8228ZK17210		8228ZK17110		8228ZK17410	
14,3	14,2	8228ZK17211		8228ZK17111		8228ZK17411	
14,4	14,3	8228ZK17212		8228ZK17112		8228ZK17412	
14,5	14,4	8228ZK17213		8228ZK17113		8228ZK17413	
14,6	14,5	8228ZK17214		8228ZK17114		8228ZK17414	
14,7	14,6	8228ZK17215		8228ZK17115		8228ZK17415	
14,8	14,7	8228ZK17216		8228ZK17116		8228ZK17416	
14,9	14,8	8228ZK17217		8228ZK17117		8228ZK17417	
15	14,9	8228ZK17218		8228ZK17118		8228ZK17418	
15,1	15	8228ZK17219		8228ZK17119		8228ZK17419	

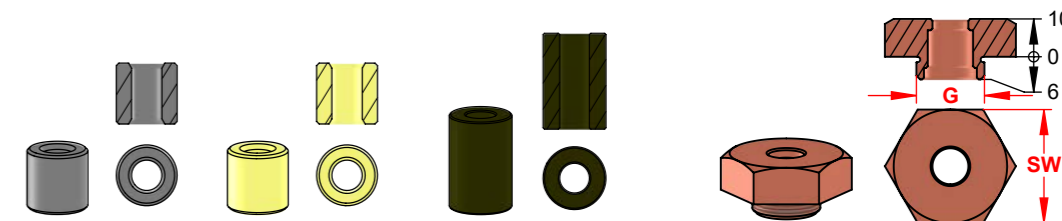
D _{0,1}	Exchange electrode			
	uncooled		cooled	
	G	SW	G	SW
	M22x1,5	30	M26x1,5	36
12	1111ZK12182		1111ZK20176	
12,1	1111ZK12183		1111ZK20177	
12,2	1111ZK12184		1111ZK20178	
12,3	1111ZK12185		1111ZK20179	
12,4	1111ZK12186		1111ZK20180	
12,5	1111ZK12187		1111ZK20181	
12,6	1111ZK12188		1111ZK20182	
12,7	1111ZK12189		1111ZK20183	
12,8	1111ZK12190		1111ZK20184	
12,9	1111ZK12191		1111ZK20185	
13	1111ZK10192		1111ZK20192	
13,1	1111ZK10193		1111ZK20193	
13,2	1111ZK10194		1111ZK20194	
13,3	1111ZK10195		1111ZK20195	
13,4	1111ZK10196		1111ZK20196	
13,5	1111ZK10197		1111ZK20197	
13,6	1111ZK10198		1111ZK20198	
13,7	1111ZK10199		1111ZK20199	
13,8	1111ZK10200		1111ZK20200	
13,9	1111ZK10201		1111ZK20201	
14	1111ZK10202		1111ZK20202	
14,1	1111ZK10203		1111ZK20203	
14,2	1111ZK10204		1111ZK20204	
14,3	1111ZK10205		1111ZK20205	
14,4	1111ZK10206		1111ZK20206	
14,5	1111ZK10207		1111ZK20207	
14,6	1111ZK10208		1111ZK20208	
14,7	1111ZK10209		1111ZK20209	
14,8	1111ZK10210		1111ZK20210	
14,9	1111ZK10211		1111ZK20211	
15	1111ZK10212		1111ZK20212	
15,1	1111ZK10213		1111ZK20213	
15,2	1111ZK10214		1111ZK20214	
15,3	1111ZK10215		1111ZK20215	

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZK with 8440ZK.

All electrodes are also available in material 2.1285. When ordering, replace the prefix 1111ZK with 1120ZK.

STUD UNCOOLED

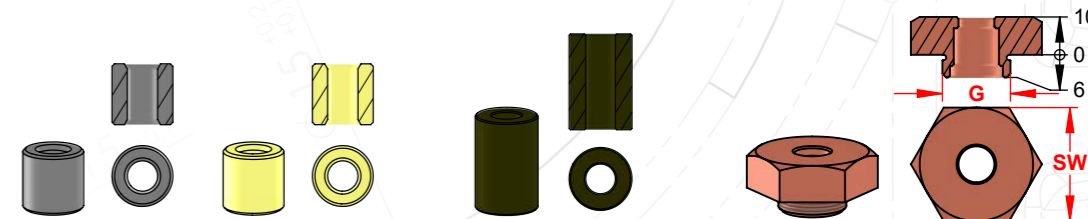


For stud	Centering sleeves	
	Volcera	Z-111
M4	8440ZK13000	8210ZK13000
M5	8440ZK13001	8210ZK13001
M6	8440ZK13002	8210ZK13002
M8	8440ZK13003	8210ZK13003
M10	8440ZK13004	8210ZK13004
M12	8440ZK13005	8210ZK13005
7/16" UNF	8440Z62256	-

Insulating insert	DOGLAS
1115ZK12000	
1115ZK12001	
1115ZK12002	
1115ZK12003	
1115ZK12004	
1115ZK12005	
1115ZK12005	

G	SW	Item No.
M18x1,5	24	1111ZK13000
M18x1,5	24	1111ZK13001
M18x1,5	24	1111ZK13002
M22x1,5	30	1111ZK13003
M22x1,5	30	1111ZK13004
M22x1,5	30	1111ZK13005
M22x1,5	30	1111ZK13005

STUD COOLED



For stud	Centering sleeves	
	Item No. Volcera	Item No. Z-111
M4	8440ZK13000	8210ZK13000
M5	8440ZK13001	8210ZK13001
M6	8440ZK13002	8210ZK13002
M8	8440ZK13003	8210ZK13003
M10	8440ZK13004	8210ZK13004
M12	8440ZK13005	8210ZK13005
7/16" UNF	8440Z62256	-
M14	8440ZK32000	-
M16	8440ZK32001	-

Insulating insert	DOGLAS
1115ZK13000	
1115ZK13001	
1115ZK13002	
1115ZK13003	
1115ZK13004	
1115ZK13005	
1115ZK13005	
1115ZK32004	
1115ZK32005	

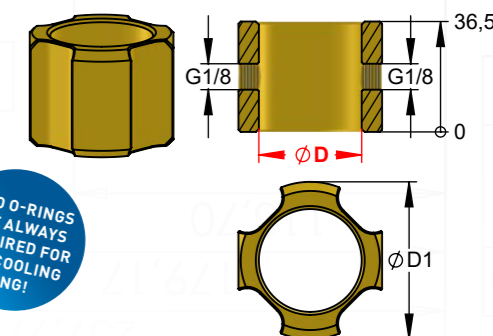
G	SW	Item No.
M20x1,5	30	1111ZK22000
M20x1,5	30	1111ZK22001
M20x1,5	30	1111ZK22002
M26x1,5	36	1111ZK22003
M26x1,5	36	1111ZK22004
M26x1,5	36	1111ZK22005
M26x1,5	36	1111ZK22005
M30x1,5	41	1111ZK32002
M30x1,5	41	1111ZK32003

COOLING RING

For stud	D	D1	Cooling ring (2.0401)
M4, M5, M6	28	46	1113ZK19766
M8, M10, M12, 7/16" UNF	34	52	1113ZK19767
M14, M16	40	65	1113ZK19770

O-ring (NBR 70)
1123ZK16436
1123ZK26187
1123Z77089

TWO O-RINGS ARE ALWAYS REQUIRED FOR THE COOLING RING!



PATENTED

MODULMASTER PRO

**MORE EFFICIENCY, LESS WASTE:
MASTERFUL PERFORMANCE AT ITS FINEST**

The DOCERAM ModulMaster Pro welding device enables reliable quality control through sensor-controlled real-time detection of the centering pin position, identifying numerous potential production errors **before** the welding process is initiated.

Our consulting team for technical applications will be happy to provide you with detailed information about the ModulMaster welding fixtures, which are also available in a stud welding version upon request. Please feel free to give us a call or write to us!

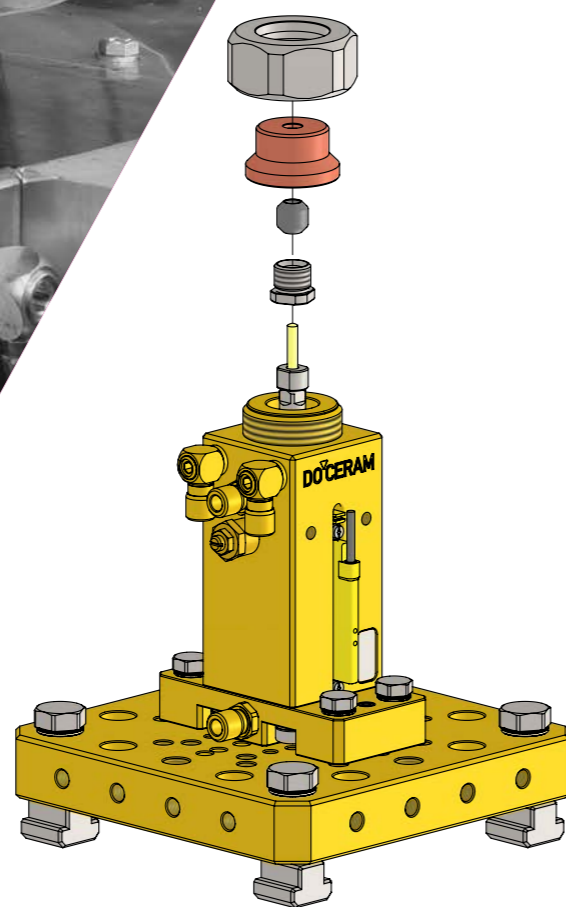
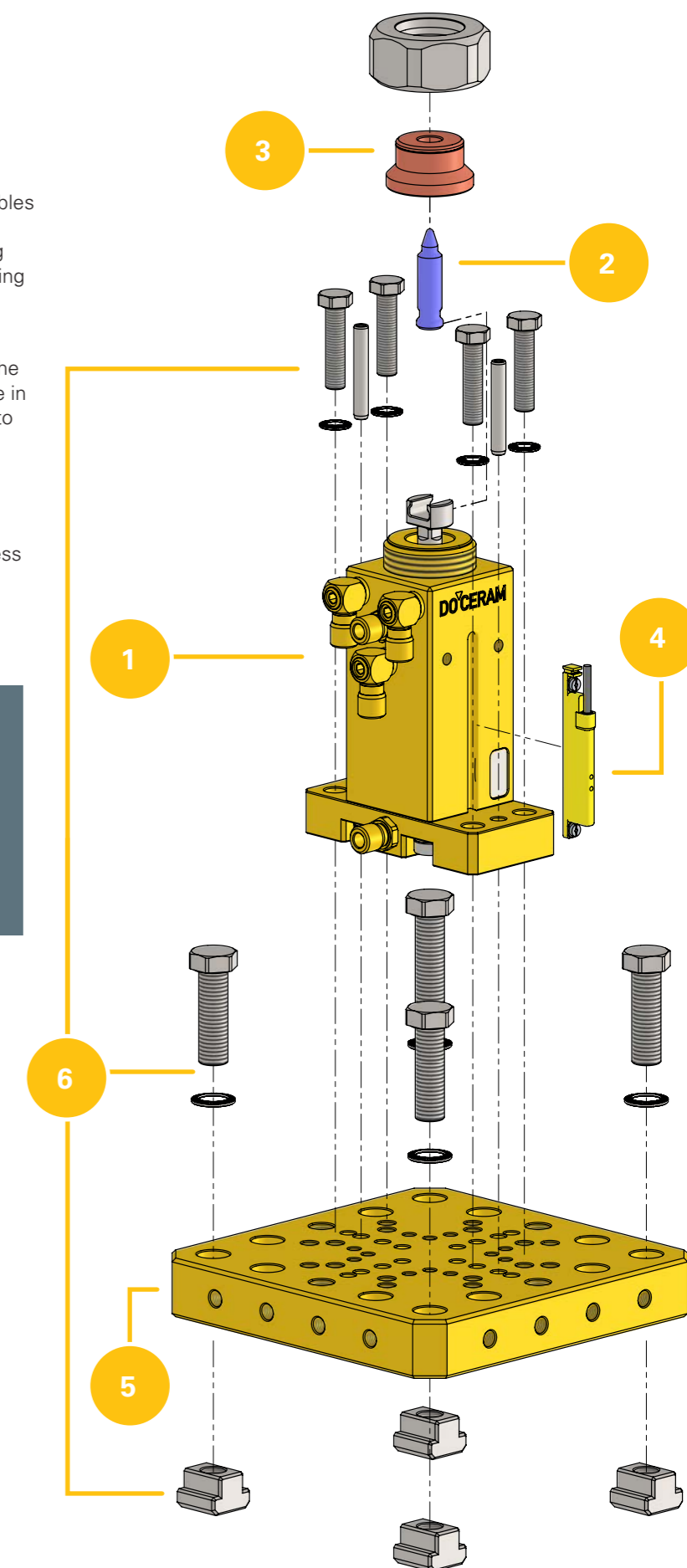
+49 231 92 50 00-444
technik@doceram.com

Alternatively, you can scan the QR code below to access the ModulMaster Pro product brochure.

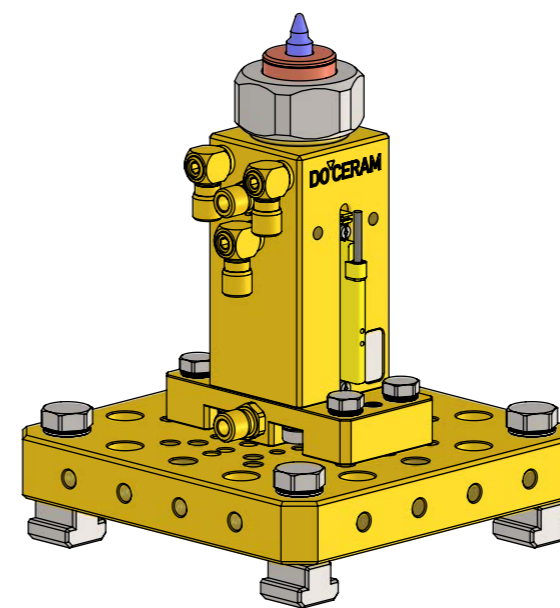


Components at a glance:

1. ModulMaster basic device
2. Centering pin made of Cerazur or Volcera
3. Exchange electrode
4. Sensor
5. Connection plate
6. Accessories such as screws, dowel pins and sliding blocks



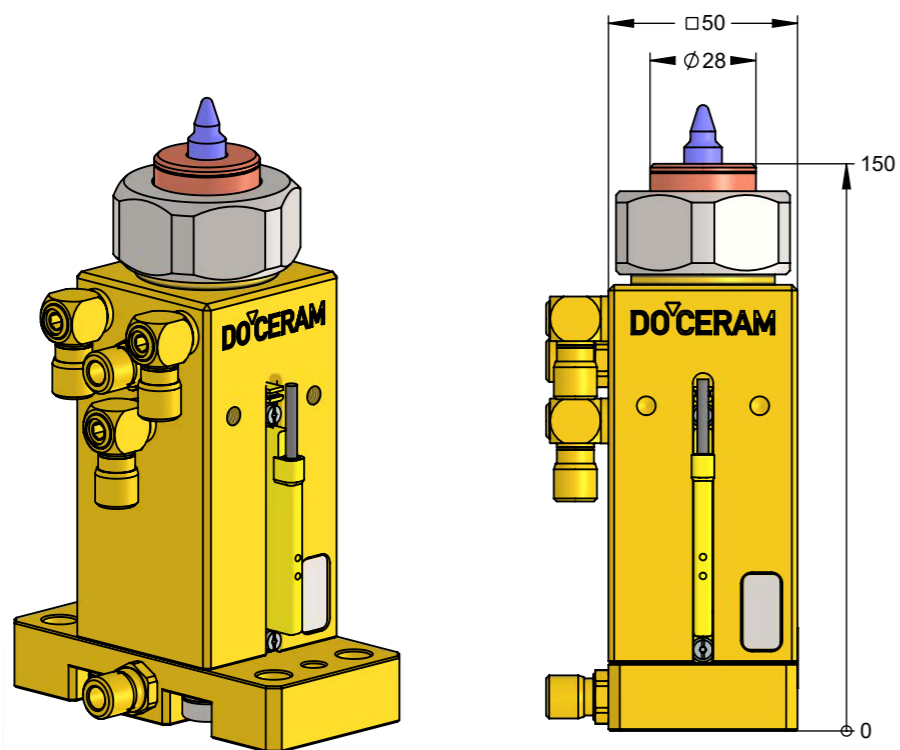
ModulMaster Pro for stud welding



ModulMaster Pro for nut welding

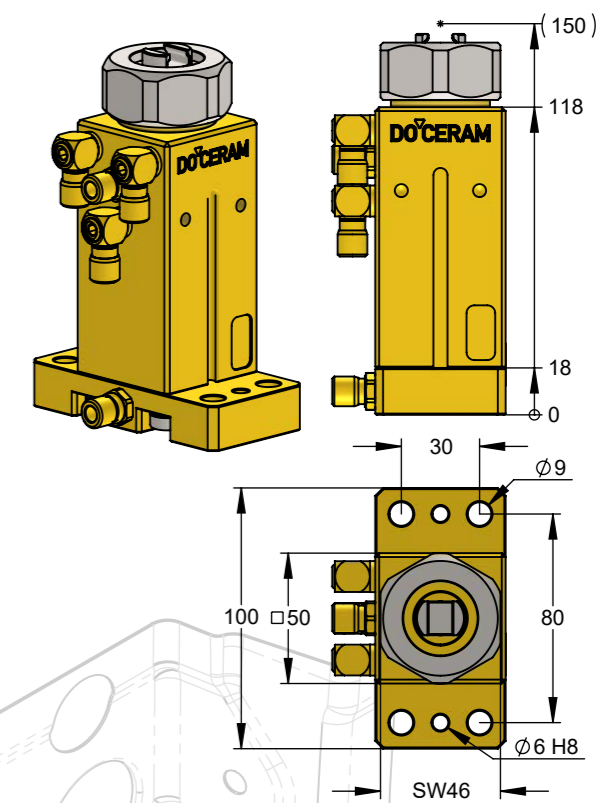
MODULMASTER PRO AND PRO MAX

MODULMASTER PRO

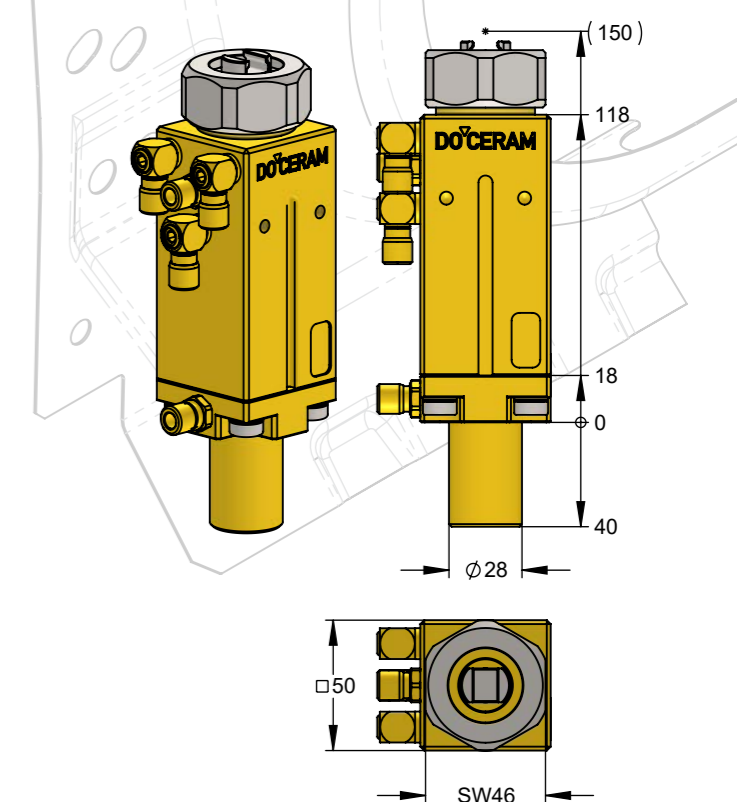
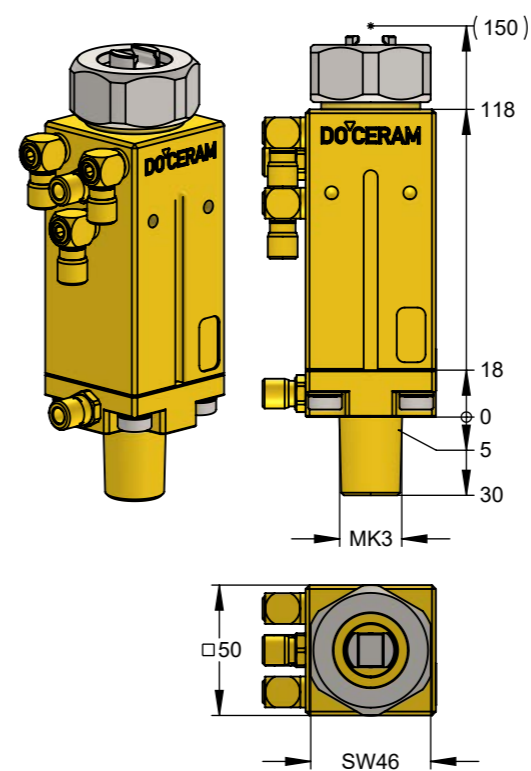
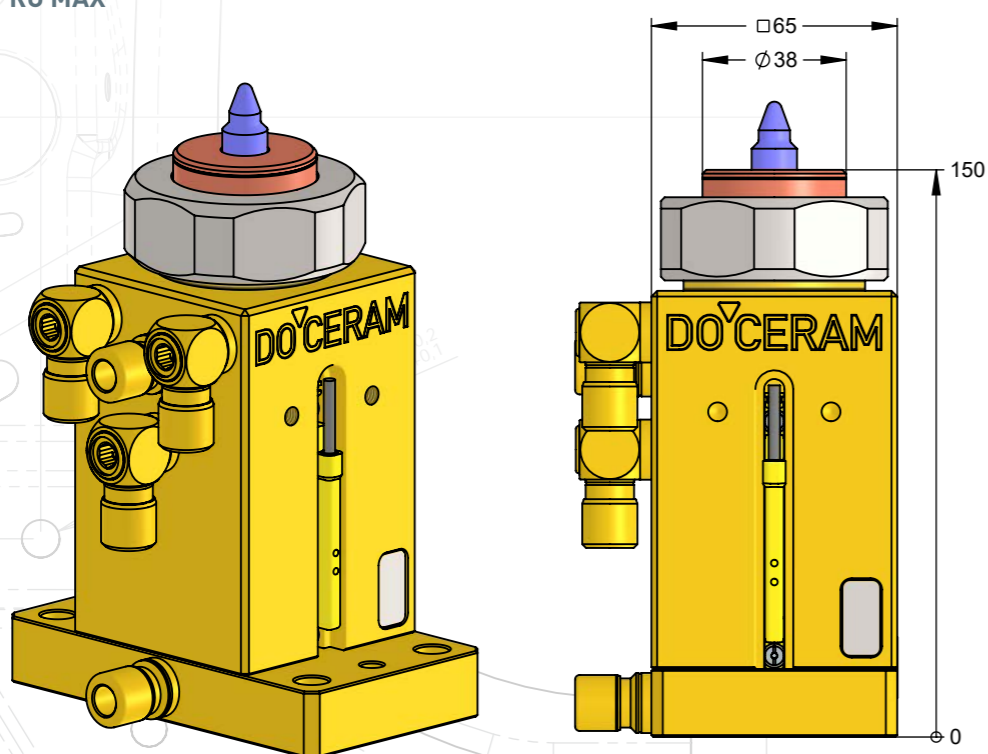


BASIC DEVICE MODULMASTER PRO

Connection type	Item No.
4xM8	7980301010
MK3	7980301020
Ø 28	7980301030

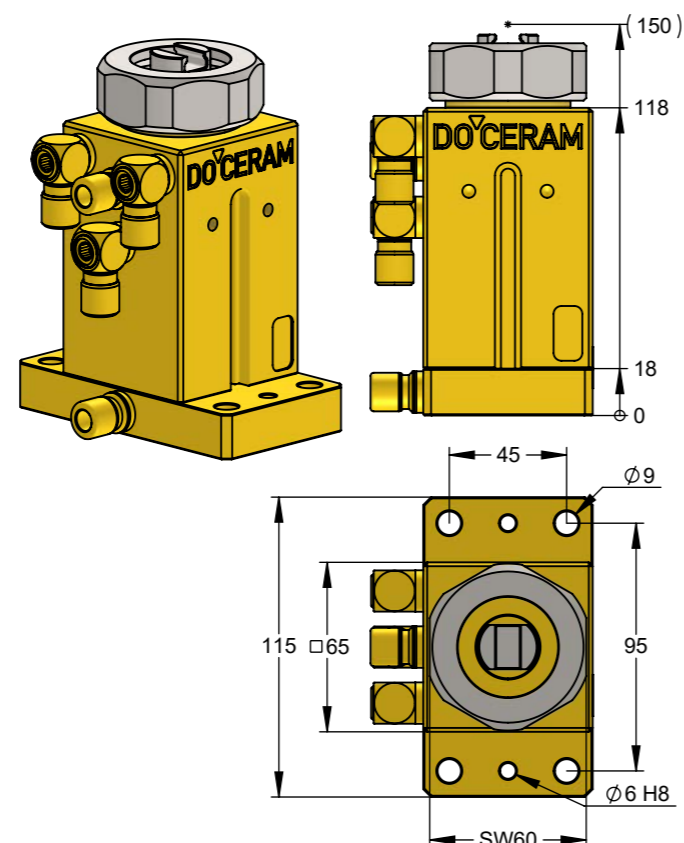


MODULMASTER PRO MAX



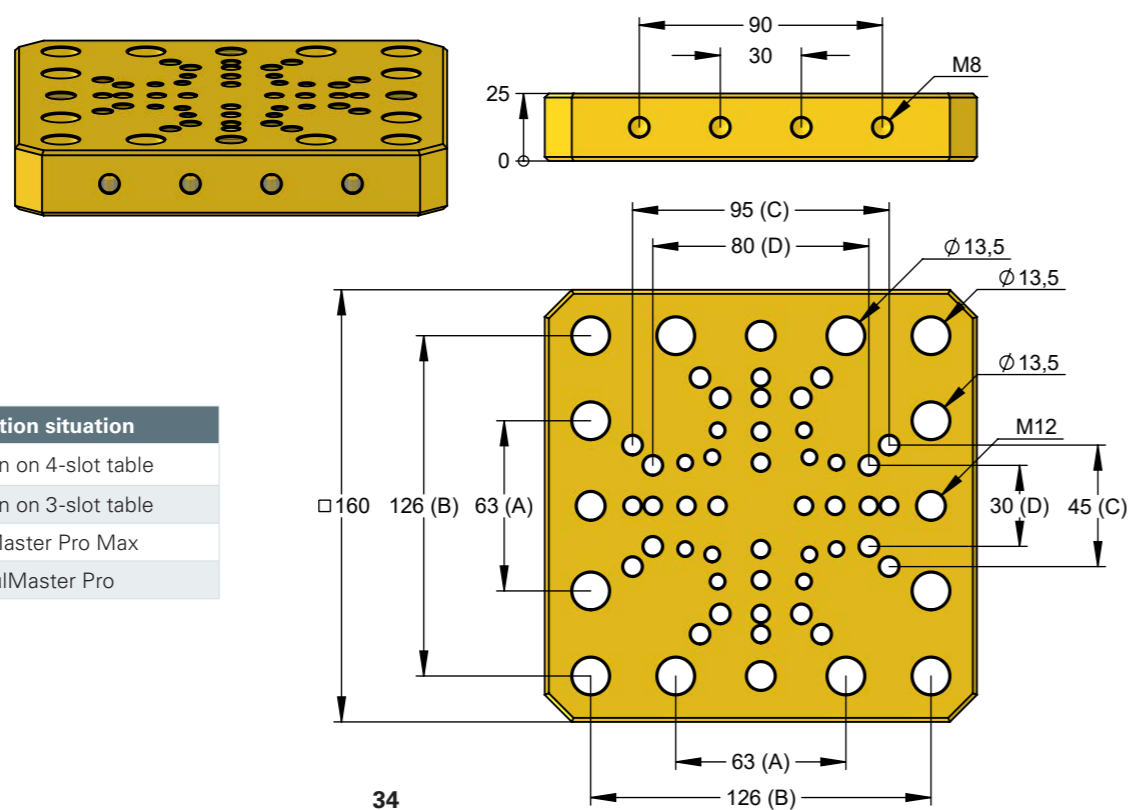
MODULMASTER PRO MAX BASIC DEVICE

Connection type	Item No.
4xM8	7980401010



BASE PLATE

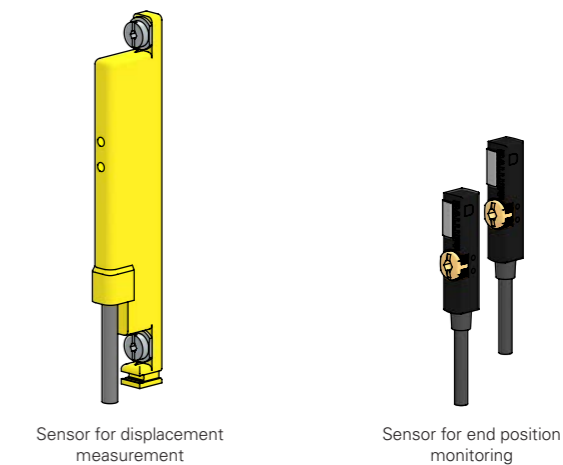
Description	Material	Item No.
Base plate Pro	2.0401 (CuZn39Pb3)	1705811616



Dimension	Installation situation
A	Installation on 4-slot table
B	Installation on 3-slot table
C	ModulMaster Pro Max
D	ModulMaster Pro

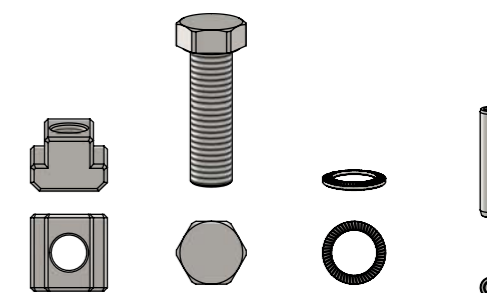
SENSOR

Function	Connection	Item No.
Displacement measurement	M8x1	1115300018
End position monitoring	M8x1	1115300027



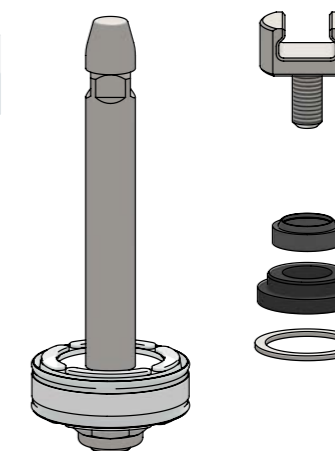
ACCESSORIES

Description	Material	Item No.
Nut for T-slots 14 mm	Stainless steel A4	N508N1412
Hexagon head screw M12x40 mm	Stainless steel A2	N4017N12040
Hexagon head screw M8x35 mm	Stainless steel A2	N4017N08035
Schnorr® lock washer for M12	Stainless steel A2	N0000N13018
Schnorr® lock washer for M8	Stainless steel A2	N0000N08413
Parallel pin with internal thread Ø6x40 mm	Stainless steel C1	N8735N06040

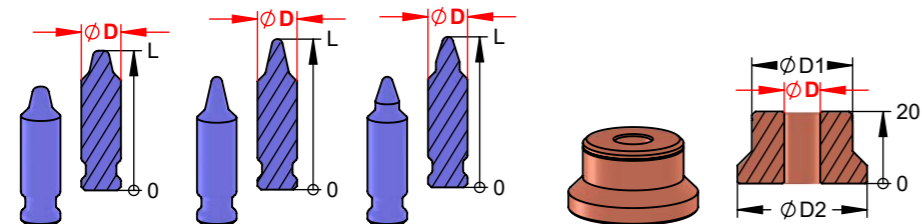


SPARE PARTS SET

Application	Item No.
ModulMaster Pro & Pro Max	7980300000



MODULMASTER CENTERING PINS FOR WELD NUT M4

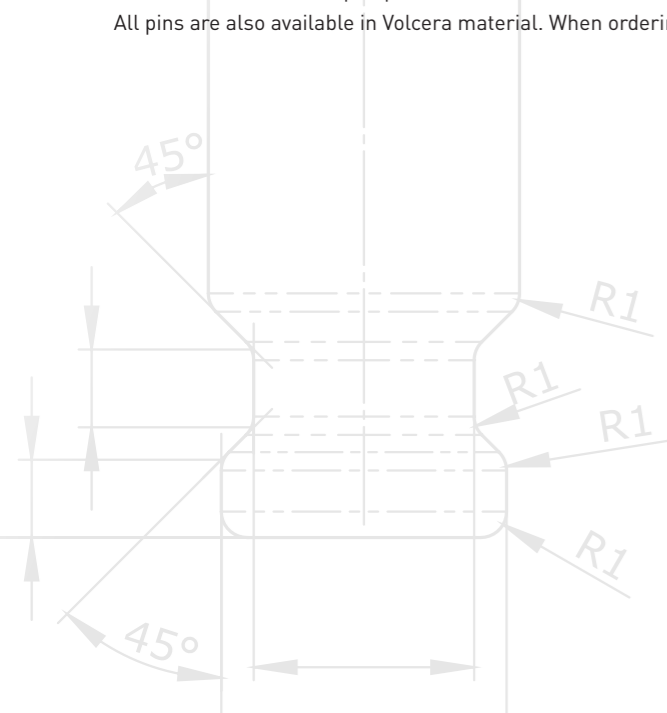


Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 33	long L: 37,5	with collar L: 37,5
4,6	4,5	8228ZVG31000	8228ZVG30000	8228ZVG30300
4,7	4,6	8228ZVG31001	8228ZVG30001	8228ZVG30301
4,8	4,7	8228ZVG31002	8228ZVG30002	8228ZVG30302
4,9	4,8	8228ZVG31003	8228ZVG30003	8228ZVG30303
5	4,9	8228ZVG31004	8228ZVG30004	8228ZVG30304
5,1	5	8228ZVG31005	8228ZVG30005	8228ZVG30305
5,2	5,1	8228ZVG31006	8228ZVG30006	8228ZVG30306
5,3	5,2	8228ZVG31007	8228ZVG30007	8228ZVG30307
5,4	5,3	8228ZVG31008	8228ZVG30008	8228ZVG30308
5,5	5,4	8228ZVG31009	8228ZVG30009	8228ZVG30309
5,6	5,5	8228ZVG31010	8228ZVG30010	8228ZVG30310
5,7	5,6	8228ZVG31011	8228ZVG30011	8228ZVG30311
5,8	5,7	8228ZVG31012	8228ZVG30012	8228ZVG30312
5,9	5,8	8228ZVG31013	8228ZVG30013	8228ZVG30313
6	5,9	8228ZVG31014	8228ZVG30014	8228ZVG30314
6,1	6	8228ZVG31015	8228ZVG30015	8228ZVG30315

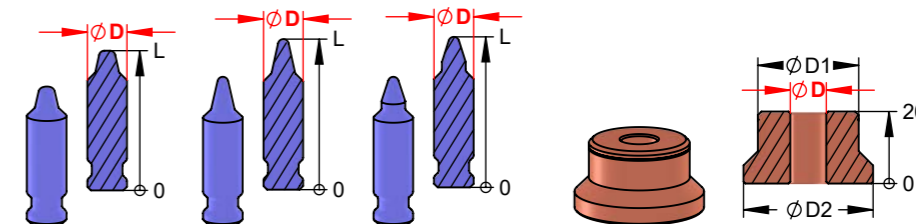
D ^{+0,1} / ₀	Exchange electrode			
	Pro D1:28	D2:36	Pro Max D1:38	D2:46
4,5	1111ZVG30000		1111400000	
4,6	1111ZVG30001		1111400001	
4,7	1111ZVG30002		1111400002	
4,8	1111ZVG30003		1111400003	
4,9	1111ZVG30004		1111400004	
5	1111ZVG30005		1111400005	
5,1	1111ZVG30006		1111400006	
5,2	1111ZVG30007		1111400007	
5,3	1111ZVG30008		1111400008	
5,4	1111ZVG30009		1111400009	
5,5	1111ZVG30010		1111400010	
5,6	1111ZVG30011		1111400011	
5,7	1111ZVG30012		1111400012	
5,8	1111ZVG30013		1111400013	
5,9	1111ZVG30014		1111400014	
6	1111ZVG30015		1111400015	
6,1	1111ZVG30016		1111400016	
6,2	1111ZVG30017		1111400017	
6,3	1111ZVG30018		1111400018	

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.



MODULMASTER CENTERING PINS FOR WELD NUT M5



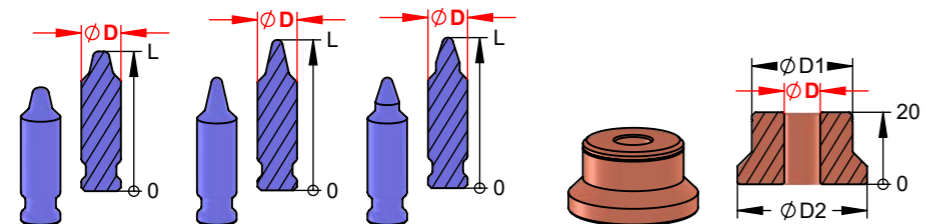
Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 33,1	long L: 37,6	with collar L: 37,6
5,6	5,5	8228ZVG31016	8228ZVG30016	8228ZVG30316
5,7	5,6	8228ZVG31017	8228ZVG30017	8228ZVG30317
5,8	5,7	8228ZVG31018	8228ZVG30018	8228ZVG30318
5,9	5,8	8228ZVG31019	8228ZVG30019	8228ZVG30319
6	5,9	8228ZVG31020	8228ZVG30020	8228ZVG30320
6,1	6	8228ZVG31021	8228ZVG30021	8228ZVG30321
6,2	6,1	8228ZVG31022	8228ZVG30022	8228ZVG30322
6,3	6,2	8228ZVG31023	8228ZVG30023	8228ZVG30323
6,4	6,3	8228ZVG31024	8228ZVG30024	8228ZVG30324
6,5	6,4	8228ZVG31025	8228ZVG30025	8228ZVG30325
6,6	6,5	8228ZVG31026	8228ZVG30026	8228ZVG30326
6,7	6,6	8228ZVG31027	8228ZVG30027	8228ZVG30327
6,8	6,7	8228ZVG31028	8228ZVG30028	8228ZVG30328
6,9	6,8	8228ZVG31029	8228ZVG30029	8228ZVG30329
7	6,9	8228ZVG31030	8228ZVG30030	8228ZVG30330
7,1	7	8228ZVG31031	8228ZVG30031	8228ZVG30331

D ^{+0,1} / ₀	Exchange electrode			
	Pro D1:28	D2:36	Pro Max D1:38	D2:46
5,5	1111ZVG30010		1111400010	
5,6	1111ZVG30011		1111400011	
5,7	1111ZVG30012		1111400012	
5,8	1111ZVG30013		1111400013	
5,9	1111ZVG30014		1111400014	
6	1111ZVG30015		1111400015	
6,1	1111ZVG30016		1111400016	
6,2	1111ZVG30017		1111400017	
6,3	1111ZVG30018		1111400018	
6,4	1111ZVG30019		1111400019	
6,5	1111ZVG30020		1111400020	
6,6	1111ZVG30021		1111400021	
6,7	1111ZVG30022		1111400022	
6,8	1111ZVG30023		1111400023	
6,9	1111ZVG30024		1111400024	
7	1111ZVG30025		1111400025	
7,1	1111ZVG30026		1111400026	
7,2	1111ZVG30027		1111400027	
7,3	1111ZVG30028		1111400028	

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER CENTERING PINS FOR WELD NUT M6



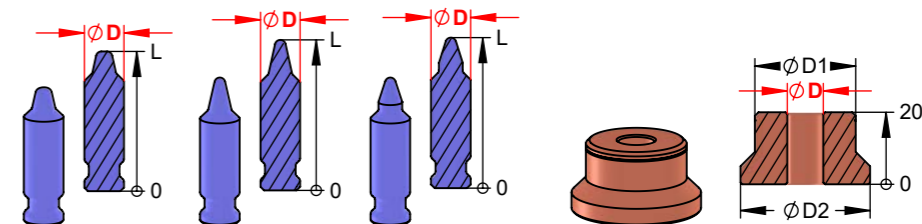
Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 34,3	long L: 40,8	with collar L: 40,8
6,6	6,5	8228ZVG31032	8228ZVG30032	8228ZVG30332
6,7	6,6	8228ZVG31033	8228ZVG30033	8228ZVG30333
6,8	6,7	8228ZVG31034	8228ZVG30034	8228ZVG30334
6,9	6,8	8228ZVG31035	8228ZVG30035	8228ZVG30335
7	6,9	8228ZVG31036	8228ZVG30036	8228ZVG30336
7,1	7	8228ZVG31037	8228ZVG30037	8228ZVG30337
7,2	7,1	8228ZVG31038	8228ZVG30038	8228ZVG30338
7,3	7,2	8228ZVG31039	8228ZVG30039	8228ZVG30339
7,4	7,3	8228ZVG31040	8228ZVG30040	8228ZVG30340
7,5	7,4	8228ZVG31041	8228ZVG30041	8228ZVG30341
7,6	7,5	8228ZVG31042	8228ZVG30042	8228ZVG30342
7,7	7,6	8228ZVG31043	8228ZVG30043	8228ZVG30343
7,8	7,7	8228ZVG31044	8228ZVG30044	8228ZVG30344
7,9	7,8	8228ZVG31045	8228ZVG30045	8228ZVG30345
8	7,9	8228ZVG31046	8228ZVG30046	8228ZVG30346
8,1	8	8228ZVG31047	8228ZVG30047	8228ZVG30347
8,2	8,1	8228ZVG31048	8228ZVG30048	8228ZVG30348
8,3	8,2	8228ZVG31049	8228ZVG30049	8228ZVG30349
8,4	8,3	8228ZVG31050	8228ZVG30050	8228ZVG30350
8,5	8,4	8228ZVG31051	8228ZVG30051	8228ZVG30351
8,6	8,5	8228ZVG31052	8228ZVG30052	8228ZVG30352

D ^{+0,1} / ₀	Exchange electrode			
	Pro D1:28	D2:36	Pro Max D1:38	D2:46
6,6	1111ZVG30021		1111400021	
6,7	1111ZVG30022		1111400022	
6,8	1111ZVG30023		1111400023	
6,9	1111ZVG30024		1111400024	
7	1111ZVG30025		1111400025	
7,1	1111ZVG30026		1111400026	
7,2	1111ZVG30027		1111400027	
7,3	1111ZVG30028		1111400028	
7,4	1111ZVG30029		1111400029	
7,5	1111ZVG30030		1111400030	
7,6	1111ZVG30031		1111400031	
7,7	1111ZVG30032		1111400032	
7,8	1111ZVG30033		1111400033	
7,9	1111ZVG30034		1111400034	
8	1111ZVG30035		1111400035	
8,1	1111ZVG30036		1111400036	
8,2	1111ZVG30037		1111400037	
8,3	1111ZVG30038		1111400038	
8,4	1111ZVG30039		1111400039	
8,5	1111ZVG30040		1111400040	
8,6	1111ZVG30041		1111400041	
8,7	1111ZVG30042		1111400042	
8,8	1111ZVG30043		1111400043	
8,9	1111ZVG30044		1111400044	

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER CENTERING PINS FOR WELD NUT M8



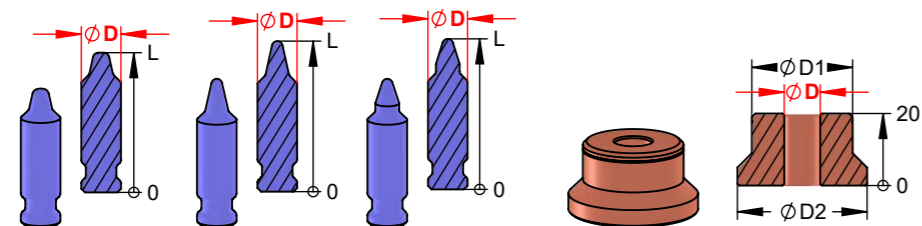
Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 36,1	long L: 41,8	with collar L: 41,8
8,6	8,5	8228ZVG31053	8228ZVG30053	8228ZVG30353
8,7	8,6	8228ZVG31054	8228ZVG30054	8228ZVG30354
8,8	8,7	8228ZVG31055	8228ZVG30055	8228ZVG30355
8,9	8,8	8228ZVG31056	8228ZVG30056	8228ZVG30356
9	8,9	8228ZVG31057	8228ZVG30057	8228ZVG30357
9,1	9	8228ZVG31058	8228ZVG30058	8228ZVG30358
9,2	9,1	8228ZVG31059	8228ZVG30059	8228ZVG30359
9,3	9,2	8228ZVG31060	8228ZVG30060	8228ZVG30360
9,4	9,3	8228ZVG31061	8228ZVG30061	8228ZVG30361
9,5	9,4	8228ZVG31062	8228ZVG30062	8228ZVG30362
9,6	9,5	8228ZVG31063	8228ZVG30063	8228ZVG30363
9,7	9,6	8228ZVG31064	8228ZVG30064	8228ZVG30364
9,8	9,7	8228ZVG31065	8228ZVG30065	8228ZVG30365
9,9	9,8	8228ZVG31066	8228ZVG30066	8228ZVG30366
10	9,9	8228ZVG31067	8228ZVG30067	8228ZVG30367
10,1	10	8228ZVG31068	8228ZVG30068	8228ZVG30368
10,2	10,1	8228ZVG31069	8228ZVG30069	8228ZVG30369
10,3	10,2	8228ZVG31070	8228ZVG30070	8228ZVG30370
10,4	10,3	8228ZVG31071	8228ZVG30071	8228ZVG30371
10,5	10,4	8228ZVG31072	8228ZVG30072	8228ZVG30372
10,6	10,5	8228ZVG31073	8228ZVG30073	8228ZVG30373
10,7	10,6	8228ZVG31074	8228ZVG30074	8228ZVG30374
10,8	10,7	8228ZVG31075	8228ZVG30075	8228ZVG30375
10,9	10,8	8228ZVG31076	8228ZVG30076	8228ZVG30376
11	10,9	8228ZVG31077	8228ZVG30077	8228ZVG30377
11,1	11	8228ZVG31078	8228ZVG30078	8228ZVG30378

D ^{+0,1} / ₀	Exchange electrode			
	Pro D1:28	D2:36	Pro Max D1:38	D2:46
8,5	1111ZVG30040		1111400040	
8,6	1111ZVG30041		1111400041	
8,7	1111ZVG30042		1111400042	
8,8	1111ZVG30043		1111400043	
8,9	1111ZVG30044		1111400044	
9	1111ZVG30045		1111400045	
9,1	1111ZVG30046		1111400046	
9,2	1111ZVG30047		1111400047	
9,3	1111ZVG30048		1111400048	
9,4	1111ZVG30049		1111400049	
9,5	1111ZVG30050		1111400050	
9,6	1111ZVG30051		1111400051	
9,7	1111ZVG30052		1111400052	
9,8	1111ZVG30053		1111400053	
9,9	1111ZVG30054		1111400054	
10	1111ZVG30055		1111400055	
10,1	1111ZVG30056		1111400056	
10,2	1111ZVG30057		1111400057	
10,3	1111ZVG30058		1111400058	
10,4	1111ZVG30059		1111400059	
10,5	1111ZVG30060		1111400060	
10,6	1111ZVG30061		1111400061	
10,7	1111ZVG30062		1111400062	
10,8	1111ZVG30063		1111400063	
10,9	1111ZVG30064		1111400064	
11	1111ZVG30065		1111400065	
11,1	1111ZVG30066		1111400066	
11,2	1111ZVG30067		1111400067	
11,3	1111ZVG30068		1111400068	

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER CENTERING PINS FOR WELD NUT M10

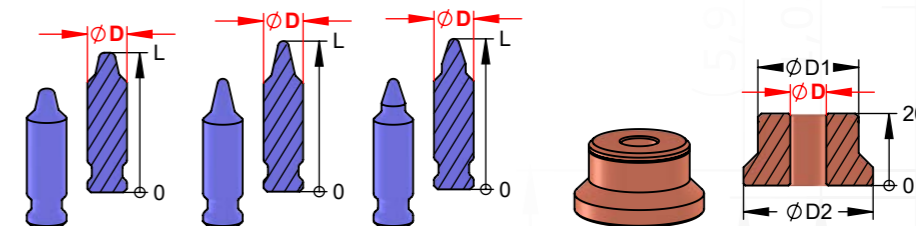


Ø sheet	Cerazur centering pin				Exchange electrode			
	D ^{-0,05} / _{-0,1}	short L: 38,5	long L: 44,3	with collar L: 44,3	D ^{+0,1} / ₀	Pro D1:28 D2:36	Pro Max D1:38 D2:46	
11,1	11	8228ZVG31079	8228ZVG30079	8228ZVG30379	11	1111ZVG30065	1111400065	
11,2	11,1	8228ZVG31080	8228ZVG30080	8228ZVG30380	11,1	1111ZVG30066	1111400066	
11,3	11,2	8228ZVG31081	8228ZVG30081	8228ZVG30381	11,2	1111ZVG30067	1111400067	
11,4	11,3	8228ZVG31082	8228ZVG30082	8228ZVG30382	11,3	1111ZVG30068	1111400068	
11,5	11,4	8228ZVG31083	8228ZVG30083	8228ZVG30383	11,4	1111ZVG30069	1111400069	
11,6	11,5	8228ZVG31084	8228ZVG30084	8228ZVG30384	11,5	1111ZVG30070	1111400070	
11,7	11,6	8228ZVG31085	8228ZVG30085	8228ZVG30385	11,6	1111ZVG30071	1111400071	
11,8	11,7	8228ZVG31086	8228ZVG30086	8228ZVG30386	11,7	1111ZVG30072	1111400072	
11,9	11,8	8228ZVG31087	8228ZVG30087	8228ZVG30387	11,8	1111ZVG30073	1111400073	
12	11,9	8228ZVG31088	8228ZVG30088	8228ZVG30388	11,9	1111ZVG30074	1111400074	
12,1	12	8228ZVG31089	8228ZVG30089	8228ZVG30389	12	1111ZVG30075	1111400075	
12,2	12,1	8228ZVG31090	8228ZVG30090	8228ZVG30390	12,1	1111ZVG30076	1111400076	
12,3	12,2	8228ZVG31091	8228ZVG30091	8228ZVG30391	12,2	1111ZVG30077	1111400077	
12,4	12,3	8228ZVG31092	8228ZVG30092	8228ZVG30392	12,3	1111ZVG30078	1111400078	
12,5	12,4	8228ZVG31093	8228ZVG30093	8228ZVG30393	12,4	1111ZVG30079	1111400079	
12,6	12,5	8228ZVG31094	8228ZVG30094	8228ZVG30394	12,5	1111ZVG30080	1111400080	
12,7	12,6	8228ZVG31095	8228ZVG30095	8228ZVG30395	12,6	1111ZVG30081	1111400081	
12,8	12,7	8228ZVG31096	8228ZVG30096	8228ZVG30396	12,7	1111ZVG30082	1111400082	
12,9	12,8	8228ZVG31097	8228ZVG30097	8228ZVG30397	12,8	1111ZVG30083	1111400083	
13	12,9	8228ZVG31098	8228ZVG30098	8228ZVG30398	12,9	1111ZVG30084	1111400084	
13,1	13	8228ZVG31099	8228ZVG30099	8228ZVG30399	13	1111ZVG30085	1111400085	
					13,1	1111ZVG30086	1111400086	
					13,2	1111ZVG30087	1111400087	
					13,3	1111ZVG30088	1111400088	

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER CENTERING PINS FOR WELD NUT M12

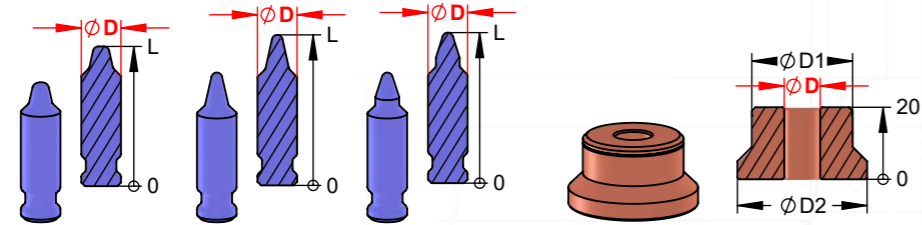


Ø sheet	Cerazur centering pin				Exchange electrode			
	D ^{-0,05} / _{-0,1}	short L: 41	long L: 44,3	with collar L: 44,3	D ^{+0,1} / ₀	Pro D1:28 D2:36	Pro Max D1:38 D2:46	
13,1	13	8228ZVG31100	8228ZVG30100	8228ZVG30400	13	1111ZVG30085	1111400085	
13,2	13,1	8228ZVG31101	8228ZVG30101	8228ZVG30401	13,1	1111ZVG30086	1111400086	
13,3	13,2	8228ZVG31102	8228ZVG30102	8228ZVG30402	13,2	1111ZVG30087	1111400087	
13,4	13,3	8228ZVG31103	8228ZVG30103	8228ZVG30403	13,3	1111ZVG30088	1111400088	
13,5	13,4	8228ZVG31104	8228ZVG30104	8228ZVG30404	13,4	1111ZVG30089	1111400089	
13,6	13,5	8228ZVG31105	8228ZVG30105	8228ZVG30405	13,5	1111ZVG30090	1111400090	
13,7	13,6	8228ZVG31106	8228ZVG30106	8228ZVG30406	13,6	1111ZVG30091	1111400091	
13,8	13,7	8228ZVG31107	8228ZVG30107	8228ZVG30407	13,7	1111ZVG30092	1111400092	
13,9	13,8	8228ZVG31108	8228ZVG30108	8228ZVG30408	13,8	1111ZVG30093	1111400093	
14	13,9	8228ZVG31109	8228ZVG30109	8228ZVG30409	13,9	1111ZVG30094	1111400094	
14,1	14	8228ZVG31110	8228ZVG30110	8228ZVG30410	14	1111ZVG30095	1111400095	
14,2	14,1	8228ZVG31111	8228ZVG30111	8228ZVG30411	14,1	1111ZVG30096	1111400096	
14,3	14,2	8228ZVG31112	8228ZVG30112	8228ZVG30412	14,2	1111ZVG30097	1111400097	
14,4	14,3	8228ZVG31113	8228ZVG30113	8228ZVG30413	14,3	1111ZVG30098	1111400098	
14,5	14,4	8228ZVG31114	8228ZVG30114	8228ZVG30414	14,4	1111ZVG30099	1111400099	
14,6	14,5	8228ZVG31115	8228ZVG30115	8228ZVG30415	14,5	1111ZVG30100	1111400100	
14,7	14,6	8228ZVG31116	8228ZVG30116	8228ZVG30416	14,6	1111ZVG30101	1111400101	
14,8	14,7	8228ZVG31117	8228ZVG30117	8228ZVG30417	14,7	1111ZVG30102	1111400102	
14,9	14,8	8228ZVG31118	8228ZVG30118	8228ZVG30418	14,8	1111ZVG30103	1111400103	
15	14,9	8228ZVG31119	8228ZVG30119	8228ZVG30419	14,9	1111ZVG30104	1111400104	
15,1	15	8228ZVG31120	8228ZVG30120	8228ZVG30420	15	1111ZVG30105	1111400105	
					15,1		1111400106	
					15,1		1111400107	
					15,3		1111400108	

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER CENTERING PINS FOR WELD NUT M14

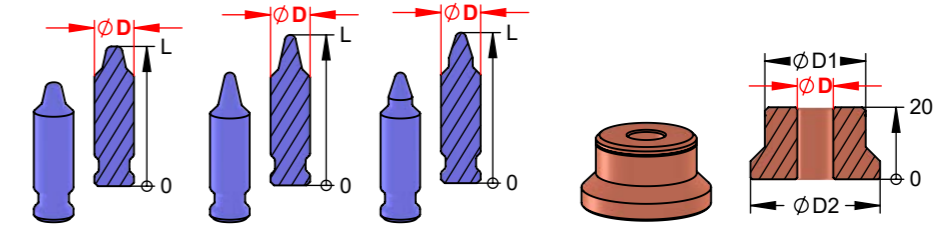


Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 40,8	long L: 44,8	with collar L: 44,8
14,6	14,5	8228ZVG31152	8228ZVG30152	8228ZVG30452
14,7	14,6	8228ZVG31153	8228ZVG30153	8228ZVG30453
14,8	14,7	8228ZVG31154	8228ZVG30154	8228ZVG30454
14,9	14,8	8228ZVG31155	8228ZVG30155	8228ZVG30455
15	14,9	8228ZVG31156	8228ZVG30156	8228ZVG30456
15,1	15	8228ZVG31157	8228ZVG30157	8228ZVG30457
15,2	15,1	8228ZVG31158	8228ZVG30158	8228ZVG30458
15,3	15,2	8228ZVG31159	8228ZVG30159	8228ZVG30459
15,4	15,3	8228ZVG31160	8228ZVG30160	8228ZVG30460
15,5	15,4	8228ZVG31161	8228ZVG30161	8228ZVG30461
15,6	15,5	8228ZVG31162	8228ZVG30162	8228ZVG30462
15,7	15,6	8228ZVG31163	8228ZVG30163	8228ZVG30463
15,8	15,7	8228ZVG31164	8228ZVG30164	8228ZVG30464
15,9	15,8	8228ZVG31165	8228ZVG30165	8228ZVG30465
16	15,9	8228ZVG31166	8228ZVG30166	8228ZVG30466
16,1	16	8228ZVG31167	8228ZVG30167	8228ZVG30467
16,2	16,1	8228ZVG31168	8228ZVG30168	8228ZVG30468
16,3	16,2	8228ZVG31169	8228ZVG30169	8228ZVG30469
16,4	16,3	8228ZVG31170	8228ZVG30170	8228ZVG30470
16,5	16,4	8228ZVG31171	8228ZVG30171	8228ZVG30471
16,6	16,5	8228ZVG31172	8228ZVG30172	8228ZVG30472
16,7	16,6	8228ZVG31173	8228ZVG30173	8228ZVG30473
16,8	16,7	8228ZVG31174	8228ZVG30174	8228ZVG30474
16,9	16,8	8228ZVG31175	8228ZVG30175	8228ZVG30475
17	16,9	8228ZVG31176	8228ZVG30176	8228ZVG30476
17,1	17	8228ZVG31177	8228ZVG30177	8228ZVG30477
17,2	17,1	8228ZVG31178	8228ZVG30178	8228ZVG30478
17,3	17,2	8228ZVG31179	8228ZVG30179	8228ZVG30479
17,4	17,3	8228ZVG31180	8228ZVG30180	8228ZVG30480
17,5	17,4	8228ZVG31181	8228ZVG30181	8228ZVG30481
17,6	17,5	8228ZVG31182	8228ZVG30182	8228ZVG30482
17,7	17,6	8228ZVG31183	8228ZVG30183	8228ZVG30483
17,8	17,7	8228ZVG31184	8228ZVG30184	8228ZVG30484
17,9	17,8	8228ZVG31185	8228ZVG30185	8228ZVG30485
18	17,9	8228ZVG31186	8228ZVG30186	8228ZVG30486

D ^{+0,1} / ₀	Exchange electrode	
	Pro Max	D1:38 D2:46
14,5	1111400100	
14,6	1111400101	
14,7	1111400102	
14,8	1111400103	
14,9	1111400104	
15	1111400105	
15,1	1111400106	
15,2	1111400107	
15,3	1111400108	
15,4	1111400109	
15,5	1111400110	
15,6	1111400111	
15,7	1111400112	
15,8	1111400113	
15,9	1111400114	
16	1111400115	
16,1	1111400116	
16,2	1111400117	
16,3	1111400118	
16,4	1111400119	
16,5	1111400120	
16,6	1111400121	
16,7	1111400122	
16,8	1111400123	
16,9	1111400124	
17	1111400125	
17,1	1111400126	
17,2	1111400127	
17,3	1111400128	
17,4	1111400129	
17,5	1111400130	
17,6	1111400131	
17,7	1111400132	
17,8	1111400133	
17,9	1111400134	
18	1111400135	
18,1	1111400136	

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode
All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER CENTERING PINS FOR WELD NUT M16



Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 41,5	long L: 45	with collar L: 45
16,6	16,5	8228ZVG31188	8228ZVG30188	8228ZVG30488
16,7	16,6	8228ZVG31189	8228ZVG30189	8228ZVG30489
16,8	16,7	8228ZVG31190	8228ZVG30190	8228ZVG30490
16,9	16,8	8228ZVG31191	8228ZVG30191	8228ZVG30491
17	16,9	8228ZVG31192	8228ZVG30192	8228ZVG30492
17,1	17	8228ZVG31193	8228ZVG30193	8228ZVG30493
17,2	17,1	8228ZVG31194	8228ZVG30194	8228ZVG30494
17,3	17,2	8228ZVG31195	8228ZVG30195	8228ZVG30495
17,4	17,3	8228ZVG31196	8228ZVG30196	8228ZVG30496
17,5	17,4	8228ZVG31197	8228ZVG30197	8228ZVG30497
17,6	17,5	8228ZVG31198	8228ZVG30198	8228ZVG30498
17,7	17,6	8228ZVG31199	8228ZVG30199	8228ZVG30499
17,8	17,7	8228ZVG31200	8228ZVG30200	8228ZVG30500
17,9	17,8	8228ZVG31201	8228ZVG30201	8228ZVG30501
18	17,9	8228ZVG31202	8228ZVG30202	8228ZVG30502
18,1	18	8228ZVG31203	8228ZVG30203	8228ZVG30503
18,2	18,1	8228ZVG31204	8228ZVG30204	8228ZVG30504
18,3	18,2	8228ZVG31205	8228ZVG30205	8228ZVG30505
18,4	18,3	8228ZVG31206	8228ZVG30206	8228ZVG30506
18,5	18,4	8228ZVG31207	8228ZVG30207	8228ZVG30507
18,6	18,5	8228ZVG31208	8228ZVG30208	8228ZVG30508
18,7	18,6	8228ZVG31209	8228ZVG30209	8228ZVG30509
18,8	18,7	8228ZVG31210	8228ZVG30210	8228ZVG30510
18,9	18,8	8228ZVG31211	8228ZVG30211	8228ZVG30511

D ^{+0,1} / ₀	Exchange electrode	
	Pro Max	D1:38 D2:46
16,5	1111400120	
16,6	1111400121	
16,7	1111400122	
16,8	1111400123	
16,9	1111400124	
17	1111400125	
17,1	1111400126	
17,2	1111400127	
17,3	1111400128	
17,4	1111400129	
17,5	1111400130	
17,6	1111400131	
17,7	1111400132	
17,8	1111400133	
17,9	1111400134	
18	1111400135	
18,1	1111400136	
18,2	1111400137	
18,3	1111400138	
18,4	1111400139	
18,5	1111400140	
18,6	1111400141	
18,7	1111400142	
18,8	1111400143	
18,9	1111400144	
19	1111400145	

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER EVO

FULL FUNCTIONALITY IN A LIMITED INSTALLATION SPACE

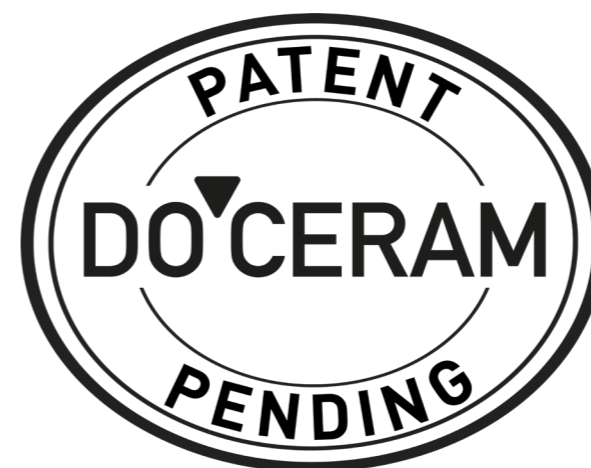
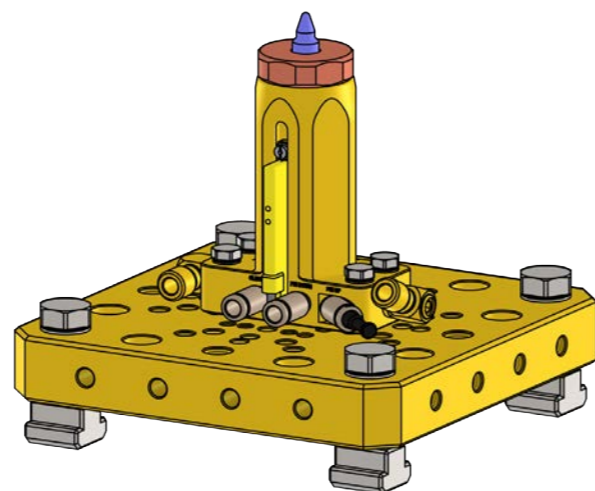
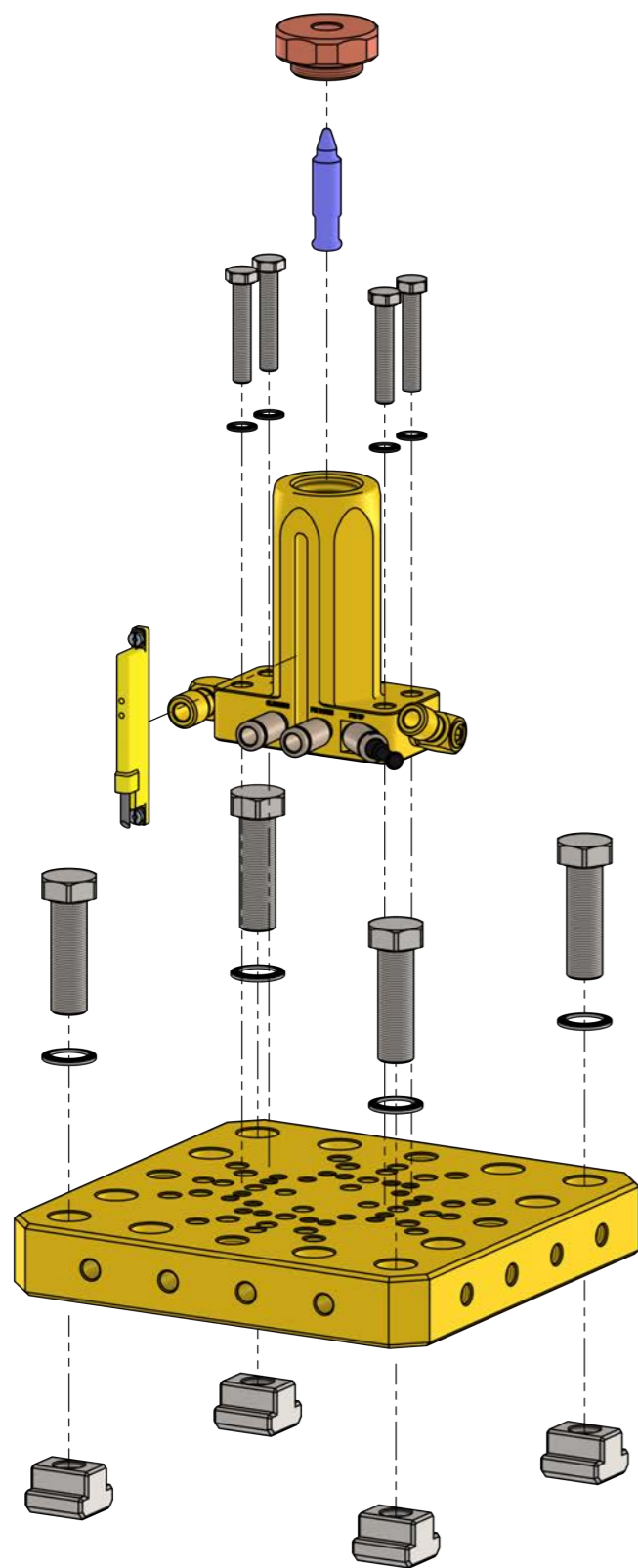
The new DOCERAM welding fixture enables welding in confined installation spaces while offering the full functional scope of a standard centering pin unit. At the same time, it stands out thanks to its significantly reduced overall size.

The ModulMaster Evo ensures reliable quality control through sensor-controlled real-time detection of the centering pin position and identifies a wide range of potential production errors before the welding process is initiated.

All hose connections are arranged on one side as well as on the underside of the fixture, reliably preventing collisions with the welding part.

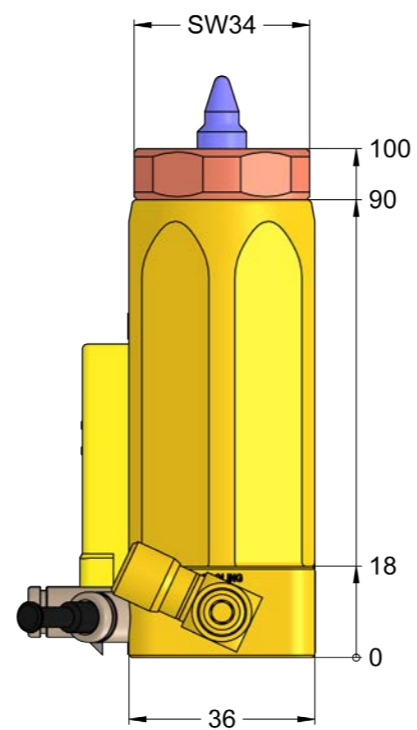
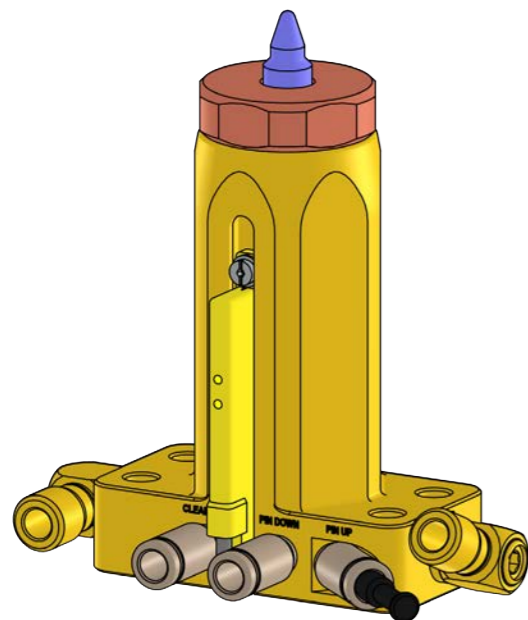
A patented maintenance cartridge allows fast and easy servicing in less than two minutes, making a significant contribution to reducing downtime.

Large-area power contacts combined with a high-performance cooling system ensure high thermal load capacity and maximum process stability. The cylinder housing is manufactured as a single piece, eliminating joint interfaces and reliably preventing the risk of thermal damage or burn marks at transition points.

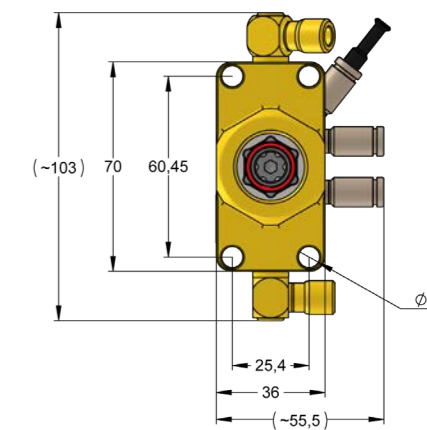
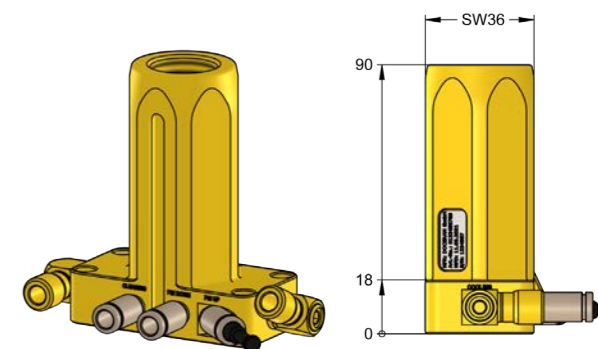


MODULMASTER EVO

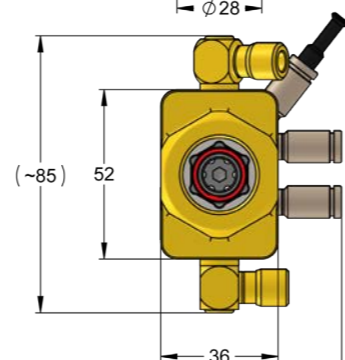
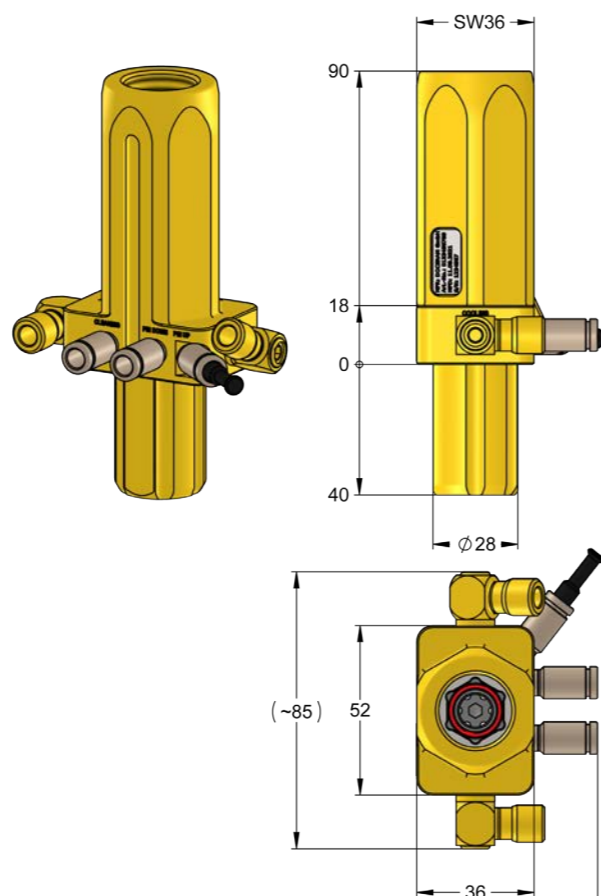
MODULMASTER EVO



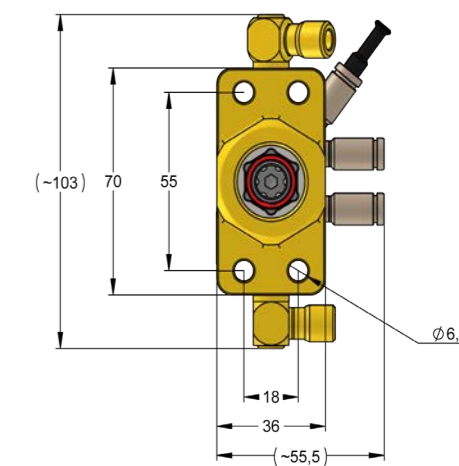
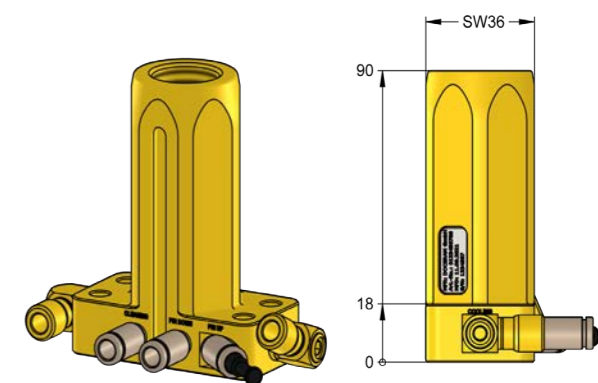
Connection type	Item No.
US-Version	7980201000



Connection type	Item No.
Ø 28	7980201030



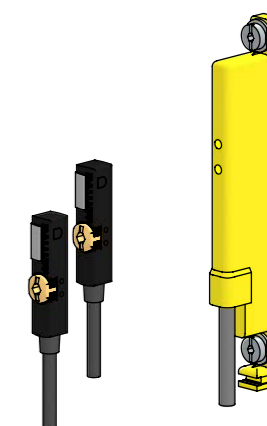
Connection type	Item No.
4xM6	7980201010



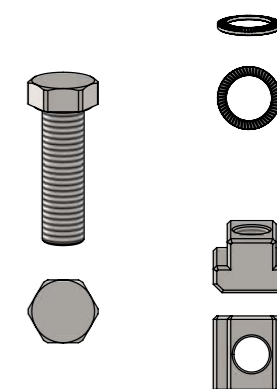


ACCESSORIES

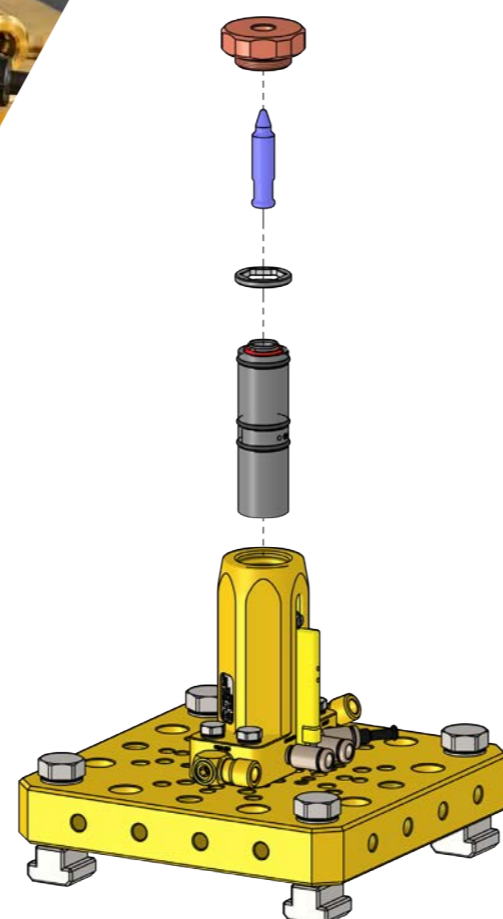
Function	Connection	Item No.
Displacement measurement	M8x1	1115300018
End position monitoring	M8x1	1115300027



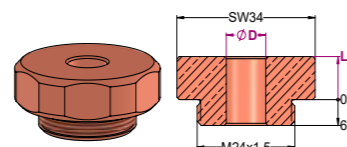
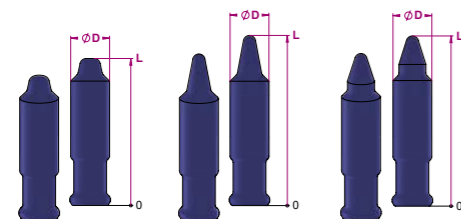
Description	Material	Item No.
Nut for T-slots 14 mm	Stainless steel A4	N508N1412
Hexagon head screw M6x40 mm	Stainless steel A2	N4017N06040
Hexagon head screw M12x40 mm	Stainless steel A2	N4017N12040
Schnorr® lock washer for M6	Stainless steel A2	N0000N06410
Schnorr® lock washer for M12	Stainless steel A2	N0000N13018



Description	Item No.
Maintenance cartridge	7980200000



MODULMASTER CENTERING PINS FOR WELD NUT M4

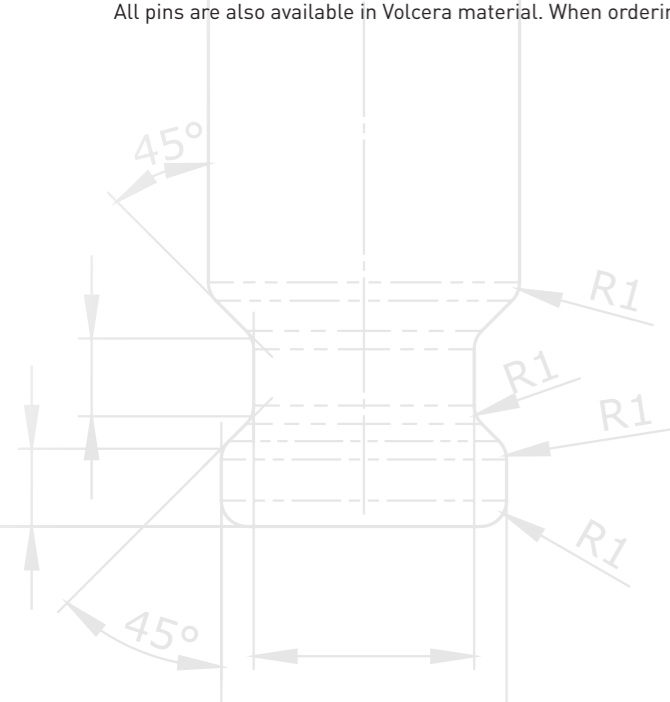


Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 33	long L: 37,5	with collar L: 37,5
4,6	4,5	8228ZVG40001	8228ZVG40017	8228ZVG40033
4,7	4,6	8228ZVG40002	8228ZVG40018	8228ZVG40034
4,8	4,7	8228ZVG40003	8228ZVG40019	8228ZVG40035
4,9	4,8	8228ZVG40004	8228ZVG40020	8228ZVG40036
5	4,9	8228ZVG40005	8228ZVG40021	8228ZVG40037
5,1	5	8228ZVG40006	8228ZVG40022	8228ZVG40038
5,2	5,1	8228ZVG40007	8228ZVG40023	8228ZVG40039
5,3	5,2	8228ZVG40008	8228ZVG40024	8228ZVG40040
5,4	5,3	8228ZVG40009	8228ZVG40025	8228ZVG40041
5,5	5,4	8228ZVG40010	8228ZVG40026	8228ZVG40042
5,6	5,5	8228ZVG40011	8228ZVG40027	8228ZVG40043
5,7	5,6	8228ZVG40012	8228ZVG40028	8228ZVG40044
5,8	5,7	8228ZVG40013	8228ZVG40029	8228ZVG40045
5,9	5,8	8228ZVG40014	8228ZVG40030	8228ZVG40046
6	5,9	8228ZVG40015	8228ZVG40031	8228ZVG40047
6,1	6	8228ZVG40016	8228ZVG40032	8228ZVG40048

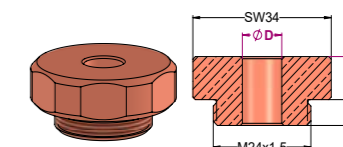
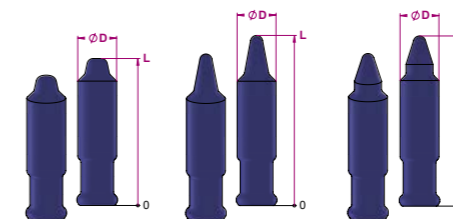
D ^{+0,1} / ₀	Exchange electrode	
	Standard L: 10	US-Version L: 8,43
4,5	111183224045	111183224045US
4,6	111183224046	111183224046US
4,7	111183224047	111183224047US
4,8	111183224048	111183224048US
4,9	111183224049	111183224049US
5	111183224050	111183224050US
5,1	111183224051	111183224051US
5,2	111183224052	111183224052US
5,3	111183224053	111183224053US
5,4	111183224054	111183224054US
5,5	111183224055	111183224055US
5,6	111183224056	111183224056US
5,7	111183224057	111183224057US
5,8	111183224058	111183224058US
5,9	111183224059	111183224059US
6	111183224060	111183224060US
6,1	111183224061	111183224061US
6,2	111183224062	111183224062US
6,3	111183224063	111183224063US

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.



MODULMASTER CENTERING PINS FOR WELD NUT M5



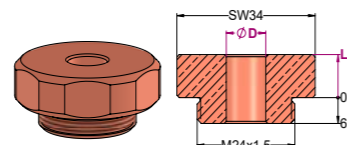
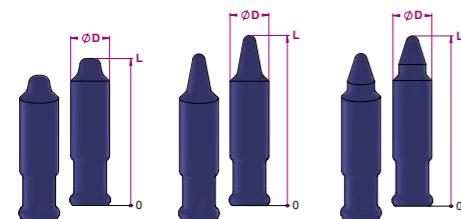
Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 33,1	long L: 37,6	with collar L: 37,6
5,6	5,5	8228ZVG40049	8228ZVG40065	8228ZVG40081
5,7	5,6	8228ZVG40050	8228ZVG40066	8228ZVG40082
5,8	5,7	8228ZVG40051	8228ZVG40067	8228ZVG40083
5,9	5,8	8228ZVG40052	8228ZVG40068	8228ZVG40084
6	5,9	8228ZVG40053	8228ZVG40069	8228ZVG40085
6,1	6	8228ZVG40054	8228ZVG40070	8228ZVG40086
6,2	6,1	8228ZVG40055	8228ZVG40071	8228ZVG40087
6,3	6,2	8228ZVG40056	8228ZVG40072	8228ZVG40088
6,4	6,3	8228ZVG40057	8228ZVG40073	8228ZVG40089
6,5	6,4	8228ZVG40058	8228ZVG40074	8228ZVG40090
6,6	6,5	8228ZVG40059	8228ZVG40075	8228ZVG40091
6,7	6,6	8228ZVG40060	8228ZVG40076	8228ZVG40092
6,8	6,7	8228ZVG40061	8228ZVG40077	8228ZVG40093
6,9	6,8	8228ZVG40062	8228ZVG40078	8228ZVG40094
7	6,9	8228ZVG40063	8228ZVG40079	8228ZVG40095
7,1	7	8228ZVG40064	8228ZVG40080	8228ZVG40096

D ^{+0,1} / ₀	Exchange electrode	
	Standard L: 10	US-Version L: 8,43
5,5	111183224055	111183224055US
5,6	111183224056	111183224056US
5,7	111183224057	111183224057US
5,8	111183224058	111183224058US
5,9	111183224059	111183224059US
6	111183224060	111183224060US
6,1	111183224061	111183224061US
6,2	111183224062	111183224062US
6,3	111183224063	111183224063US
6,4	111183224064	111183224064US
6,5	111183224065	111183224065US
6,6	111183224066	111183224066US
6,7	111183224067	111183224067US
6,8	111183224068	111183224068US
6,9	111183224069	111183224069US
7	111183224070	111183224070US
7,1	111183224071	111183224071US
7,2	111183224072	111183224072US
7,3	111183224073	111183224073US

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER CENTERING PINS FOR WELD NUT M6



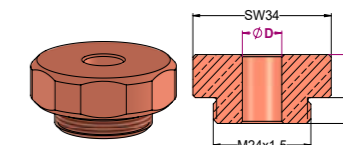
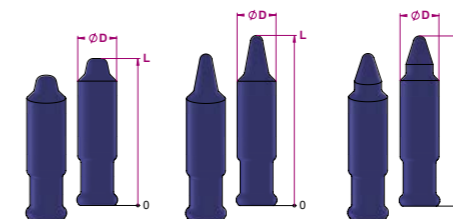
Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 34,3	long L: 40,8	with collar L: 40,8
6,6	6,5	8228ZVG40097	8228ZVG40118	8228ZVG40139
6,7	6,6	8228ZVG40098	8228ZVG40119	8228ZVG40140
6,8	6,7	8228ZVG40099	8228ZVG40120	8228ZVG40141
6,9	6,8	8228ZVG40100	8228ZVG40121	8228ZVG40142
7	6,9	8228ZVG40101	8228ZVG40122	8228ZVG40143
7,1	7	8228ZVG40102	8228ZVG40123	8228ZVG40144
7,2	7,1	8228ZVG40103	8228ZVG40124	8228ZVG40145
7,3	7,2	8228ZVG40104	8228ZVG40125	8228ZVG40146
7,4	7,3	8228ZVG40105	8228ZVG40126	8228ZVG40147
7,5	7,4	8228ZVG40106	8228ZVG40127	8228ZVG40148
7,6	7,5	8228ZVG40107	8228ZVG40128	8228ZVG40149
7,7	7,6	8228ZVG40108	8228ZVG40129	8228ZVG40150
7,8	7,7	8228ZVG40109	8228ZVG40130	8228ZVG40151
7,9	7,8	8228ZVG40110	8228ZVG40131	8228ZVG40152
8	7,9	8228ZVG40111	8228ZVG40132	8228ZVG40153
8,1	8	8228ZVG40112	8228ZVG40133	8228ZVG40154
8,2	8,1	8228ZVG40113	8228ZVG40134	8228ZVG40155
8,3	8,2	8228ZVG40114	8228ZVG40135	8228ZVG40156
8,4	8,3	8228ZVG40115	8228ZVG40136	8228ZVG40157
8,5	8,4	8228ZVG40116	8228ZVG40137	8228ZVG40158
8,6	8,5	8228ZVG40117	8228ZVG40138	8228ZVG40159

D ^{+0,1} / ₀	Exchange electrode	
	Standard L: 10	US-Version L: 8,43
6,6	111183224066	111183224066US
6,7	111183224067	111183224067US
6,8	111183224068	111183224068US
6,9	111183224069	111183224069US
7	111183224070	111183224070US
7,1	111183224071	111183224071US
7,2	111183224072	111183224072US
7,3	111183224073	111183224073US
7,4	111183224074	111183224074US
7,5	111183224075	111183224075US
7,6	111183224076	111183224076US
7,7	111183224077	111183224077US
7,8	111183224078	111183224078US
7,9	111183224079	111183224079US
8	111183224080	111183224080US
8,1	111183224081	111183224081US
8,2	111183224082	111183224082US
8,3	111183224083	111183224083US
8,4	111183224084	111183224084US
8,5	111183224085	111183224085US
8,6	111183224086	111183224086US
8,7	111183224087	111183224087US
8,8	111183224088	111183224088US
8,9	111183224089	111183224089US

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER CENTERING PINS FOR WELD NUT M8



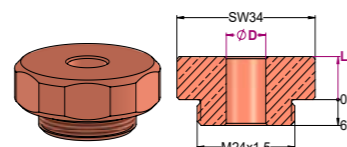
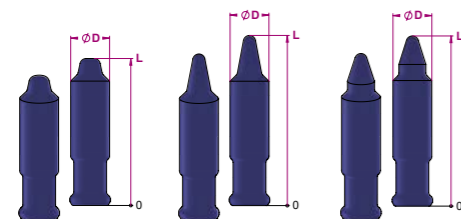
Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 36,1	long L: 41,8	with collar L: 41,8
8,6	8,5	8228ZVG40160	8228ZVG40186	8228ZVG40212
8,7	8,6	8228ZVG40161	8228ZVG40187	8228ZVG40213
8,8	8,7	8228ZVG40162	8228ZVG40188	8228ZVG40214
8,9	8,8	8228ZVG40163	8228ZVG40189	8228ZVG40215
9	8,9	8228ZVG40164	8228ZVG40190	8228ZVG40216
9,1	9	8228ZVG40165	8228ZVG40191	8228ZVG40217
9,2	9,1	8228ZVG40166	8228ZVG40192	8228ZVG40218
9,3	9,2	8228ZVG40167	8228ZVG40193	8228ZVG40219
9,4	9,3	8228ZVG40168	8228ZVG40194	8228ZVG40220
9,5	9,4	8228ZVG40169	8228ZVG40195	8228ZVG40221
9,6	9,5	8228ZVG40170	8228ZVG40196	8228ZVG40222
9,7	9,6	8228ZVG40171	8228ZVG40197	8228ZVG40223
9,8	9,7	8228ZVG40172	8228ZVG40198	8228ZVG40224
9,9	9,8	8228ZVG40173	8228ZVG40199	8228ZVG40225
10	9,9	8228ZVG40174	8228ZVG40200	8228ZVG40226
10,1	10	8228ZVG40175	8228ZVG40201	8228ZVG40227
10,2	10,1	8228ZVG40176	8228ZVG40202	8228ZVG40228
10,3	10,2	8228ZVG40177	8228ZVG40203	8228ZVG40229
10,4	10,3	8228ZVG40178	8228ZVG40204	8228ZVG40230
10,5	10,4	8228ZVG40179	8228ZVG40205	8228ZVG40231
10,6	10,5	8228ZVG40180	8228ZVG40206	8228ZVG40232
10,7	10,6	8228ZVG40181	8228ZVG40207	8228ZVG40233
10,8	10,7	8228ZVG40182	8228ZVG40208	8228ZVG40234
10,9	10,8	8228ZVG40183	8228ZVG40209	8228ZVG40235
11	10,9	8228ZVG40184	8228ZVG40210	8228ZVG40236
11,1	11	8228ZVG40185	8228ZVG40211	8228ZVG40237

D ^{+0,1} / ₀	Exchange electrode	
	Standard L: 10	US-Version L: 8,43
8,5	111183224085	111183224085US
8,6	111183224086	111183224086US
8,7	111183224087	111183224087US
8,8	111183224088	111183224088US
8,9	111183224089	111183224089US
9	111183224090	111183224090US
9,1	111183224091	111183224091US
9,2	111183224092	111183224092US
9,3	111183224093	111183224093US
9,4	111183224094	111183224094US
9,5	111183224095	111183224095US
9,6	111183224096	111183224096US
9,7	111183224097	111183224097US
9,8	111183224098	111183224098US
9,9	111183224099	111183224099US
10	111183224100	111183224100US
10,1	111183224101	111183224101US
10,2	111183224102	111183224102US
10,3	111183224103	111183224103US
10,4	111183224104	111183224104US
10,5	111183224105	111183224105US
10,6	111183224106	111183224106US
10,7	111183224107	111183224107US
10,8	111183224108	111183224108US
10,9	111183224109	111183224109US
11	111183224110	111183224110US
11,1	111183224111	111183224111US
11,2	111183224112	111183224112US
11,3	111183224113	111183224113US

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER CENTERING PINS FOR WELD NUT M10



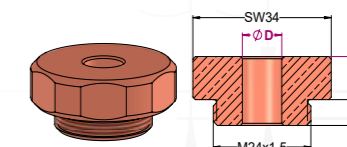
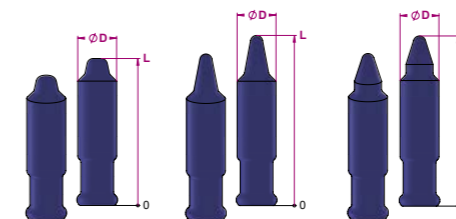
Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 38,5	long L: 44,3	with collar L: 44,3
11,1	11	8228ZVG40238	8228ZVG40259	8228ZVG40280
11,2	11,1	8228ZVG40239	8228ZVG40260	8228ZVG40281
11,3	11,2	8228ZVG40240	8228ZVG40261	8228ZVG40282
11,4	11,3	8228ZVG40241	8228ZVG40262	8228ZVG40283
11,5	11,4	8228ZVG40242	8228ZVG40263	8228ZVG40284
11,6	11,5	8228ZVG40243	8228ZVG40264	8228ZVG40285
11,7	11,6	8228ZVG40244	8228ZVG40265	8228ZVG40286
11,8	11,7	8228ZVG40245	8228ZVG40266	8228ZVG40287
11,9	11,8	8228ZVG40246	8228ZVG40267	8228ZVG40288
12	11,9	8228ZVG40247	8228ZVG40268	8228ZVG40289
12,1	12	8228ZVG40248	8228ZVG40269	8228ZVG40290
12,2	12,1	8228ZVG40249	8228ZVG40270	8228ZVG40291
12,3	12,2	8228ZVG40250	8228ZVG40271	8228ZVG40292
12,4	12,3	8228ZVG40251	8228ZVG40272	8228ZVG40293
12,5	12,4	8228ZVG40252	8228ZVG40273	8228ZVG40294
12,6	12,5	8228ZVG40253	8228ZVG40274	8228ZVG40295
12,7	12,6	8228ZVG40254	8228ZVG40275	8228ZVG40296
12,8	12,7	8228ZVG40255	8228ZVG40276	8228ZVG40297
12,9	12,8	8228ZVG40256	8228ZVG40277	8228ZVG40298
13	12,9	8228ZVG40257	8228ZVG40278	8228ZVG40299
13,1	13	8228ZVG40258	8228ZVG40279	8228ZVG40300

D ^{+0,1} / ₀	Exchange electrode	
	Standard L: 10	US-Version L: 8,43
11	111183224110	111183224110US
11,1	111183224111	111183224111US
11,2	111183224112	111183224112US
11,3	111183224113	111183224113US
11,4	111183224114	111183224114US
11,5	111183224115	111183224115US
11,6	111183224116	111183224116US
11,7	111183224117	111183224117US
11,8	111183224118	111183224118US
11,9	111183224119	111183224119US
12	111183224120	111183224120US
12,1	111183224121	111183224121US
12,2	111183224122	111183224122US
12,3	111183224123	111183224123US
12,4	111183224124	111183224124US
12,5	111183224125	111183224125US
12,6	111183224126	111183224126US
12,7	111183224127	111183224127US
12,8	111183224128	111183224128US
12,9	111183224129	111183224129US
13	111183224130	111183224130US
13,1	111183224131	111183224131US
13,2	111183224132	111183224132US
13,3	111183224133	111183224133US

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

MODULMASTER CENTERING PINS FOR WELD NUT M12



Ø sheet	D ^{-0,05} / _{-0,1}	Cerazur centering pin		
		short L: 41	long L: 44,3	with collar L: 44,3
13,1	13	8228ZVG40301	8228ZVG40322	8228ZVG40343
13,2	13,1	8228ZVG40302	8228ZVG40323	8228ZVG40344
13,3	13,2	8228ZVG40303	8228ZVG40324	8228ZVG40345
13,4	13,3	8228ZVG40304	8228ZVG40325	8228ZVG40346
13,5	13,4	8228ZVG40305	8228ZVG40326	8228ZVG40347
13,6	13,5	8228ZVG40306	8228ZVG40327	8228ZVG40348
13,7	13,6	8228ZVG40307	8228ZVG40328	8228ZVG40349
13,8	13,7	8228ZVG40308	8228ZVG40329	8228ZVG40350
13,9	13,8	8228ZVG40309	8228ZVG40330	8228ZVG40351
14	13,9	8228ZVG40310	8228ZVG40331	8228ZVG40352
14,1	14	8228ZVG40311	8228ZVG40332	8228ZVG40353
14,2	14,1	8228ZVG40312	8228ZVG40333	8228ZVG40354
14,3	14,2	8228ZVG40313	8228ZVG40334	8228ZVG40355
14,4	14,3	8228ZVG40314	8228ZVG40335	8228ZVG40356
14,5	14,4	8228ZVG40315	8228ZVG40336	8228ZVG40357
14,6	14,5	8228ZVG40316	8228ZVG40337	8228ZVG40358
14,7	14,6	8228ZVG40317	8228ZVG40338	8228ZVG40359
14,8	14,7	8228ZVG40318	8228ZVG40339	8228ZVG40360
14,9	14,8	8228ZVG40319	8228ZVG40340	8228ZVG40361
15	14,9	8228ZVG40320	8228ZVG40341	8228ZVG40362
15,1	15	8228ZVG40321	8228ZVG40342	8228ZVG40363

D ^{+0,1} / ₀	Exchange electrode	
	Standard L: 10	US-Version L: 8,43
13	111183224130	111183224130US
13,1	111183224131	111183224131US
13,2	111183224132	111183224132US
13,3	111183224133	111183224133US
13,4	111183224134	111183224134US
13,5	111183224135	111183224135US
13,6	111183224136	111183224136US
13,7	111183224137	111183224137US
13,8	111183224138	111183224138US
13,9	111183224139	111183224139US
14	111183224140	111183224140US
14,1	111183224141	111183224141US
14,2	111183224142	111183224142US
14,3	111183224143	111183224143US
14,4	111183224144	111183224144US
14,5	111183224145	111183224145US
14,6	111183224146	111183224146US
14,7	111183224147	111183224147US
14,8	111183224148	111183224148US
14,9	111183224149	111183224149US
15	111183224150	111183224150US
15,1	111183224151	111183224151US
15,1	111183224152	111183224152US
15,3	111183224153	111183224153US

Selection of centering pin and electrode according to DOCERAM recommendation:
Sheet metal hole - 0.1 = pin; pin + 0.2 = electrode

All pins are also available in Volcera material. When ordering, replace the prefix 8228ZVG with 8443ZVG.

CC-MASTER

COMPACT PLC CONTROLLER FOR MODULMASTER PRO WITH A DISPLACEMENT MEASUREMENT SYSTEM

The CC-Master compact control unit verifies the correct position of the nut and the pneumatic functions of the ModulMaster Pro, including pin retracting.

operation using the dummy plug supplied.

Rely on the complete solutions of ModulMaster Pro and CC-Master to prevent complaints before they arise.

The special features of the CC-Master:

- Nut control
- Component control
- Pin retracting function
- Regulated blast air
- Nest-free option

The CC-Master is designed to use with any resistance projection welding system that does not have its own sequence control. Its compact design allows it to be mounted on or near any welding machine.

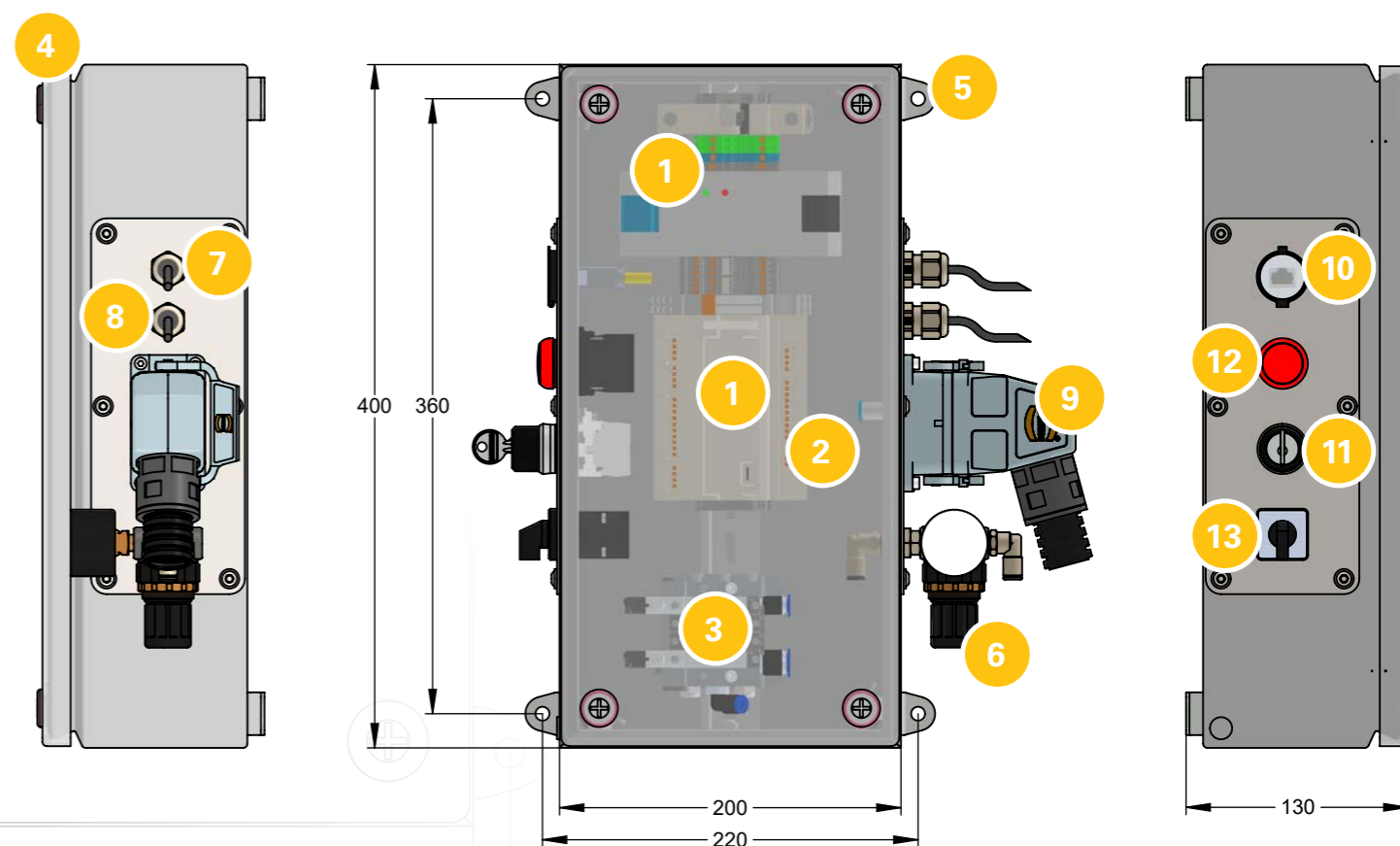
With the CC-Master, a 100% reversible option has been created to equip your machine with an intelligent nut control system. Intervention in the existing system is minimal; only the release signal from the existing welding machine is interrupted until the correct position of the nut is detected.

If you use different welding tools with your system, you can easily restore your machine to its original state in a single

Description	Item No.
CC-Master (PLC for ModulMaster)	7980901010

DO CERAM

1. PLC Compact Controller
2. Digital and analog input & output level
3. Valve terminal
4. Metal housing IP54
5. Wall mounting
6. Pneumatic supply
7. Power supply 230V/50Hz
8. Synchronization projection welding machine
9. Plug welding device
10. Ethernet interface
11. Key switch for operating mode
12. Indicator light
13. Main switch



CAD-PORTAL

DOWNLOAD 3D MODELS QUICKLY, EASILY AND FREE OF CHARGE!

Our CAD portal provides a comprehensive library of 3D models to download. Whether you need individual components or complete welding tools, you will find a wide selection of models for your project.

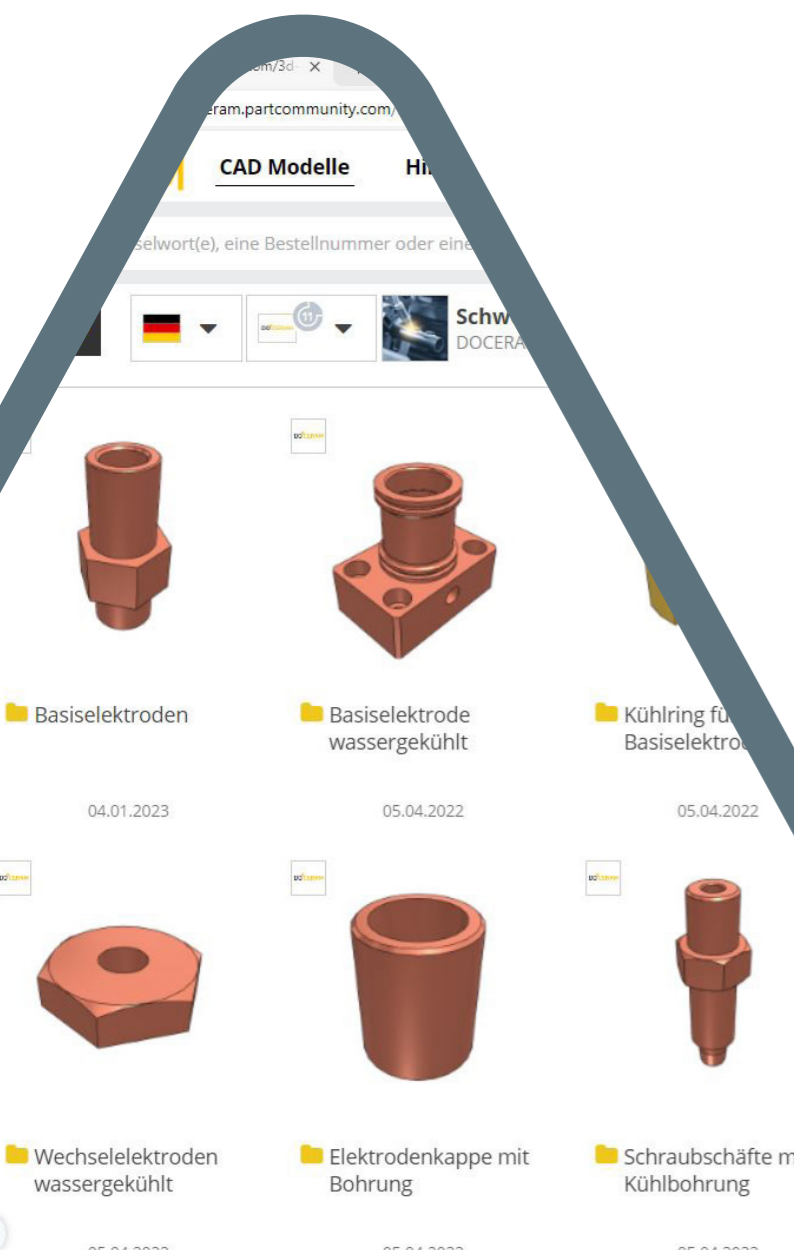
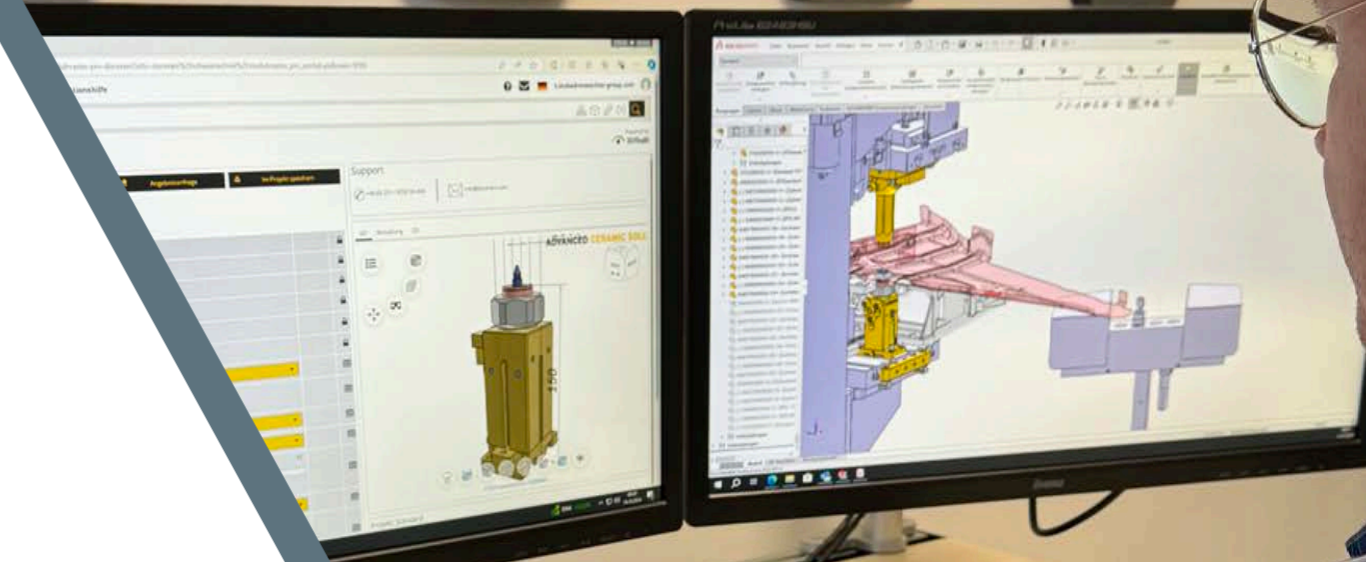
Download the components you need and integrate them into your system. This enables you to check the installation space of the machine and the support of your welded parts on the lower electrode. You can also ensure that there are no collisions with the robot arm in your automated welding cell.

A particular highlight is the option to configure certain products such as the upper electrode, ModulMaster Pro and complete electrodes, online. By entering selectable

parameters, a customized CAD model is generated that precisely meets your requirements.

All models are available in standard CAD formats and can be seamlessly integrated into your designs.

Benefit from significant time savings during development and obtain the right CAD data with just a few clicks. Our CAD portal - your central point of contact for professional 3D models!



You can access the portal at:
<https://doceram.partcommunity.com>

Alternatively, you can scan the QR code on the right to be directed straight to the portal.



ENGINEERING OF WELDING TOOLS

INDIVIDUAL SPECIAL SOLUTIONS: TAILORED TO YOUR AREA OF APPLICATION

All products in the DOCERAM portfolio can be tailored to your process. We have already developed and implemented numerous special solutions for our customers' current production systems.

Our designers and application engineers assist you in developing and visualizing complex welding tools for challenging tasks.

Thanks to the seamless integration of CAD and FEM, you can monitor your products from the development phase - quickly, efficiently and cost-effectively.

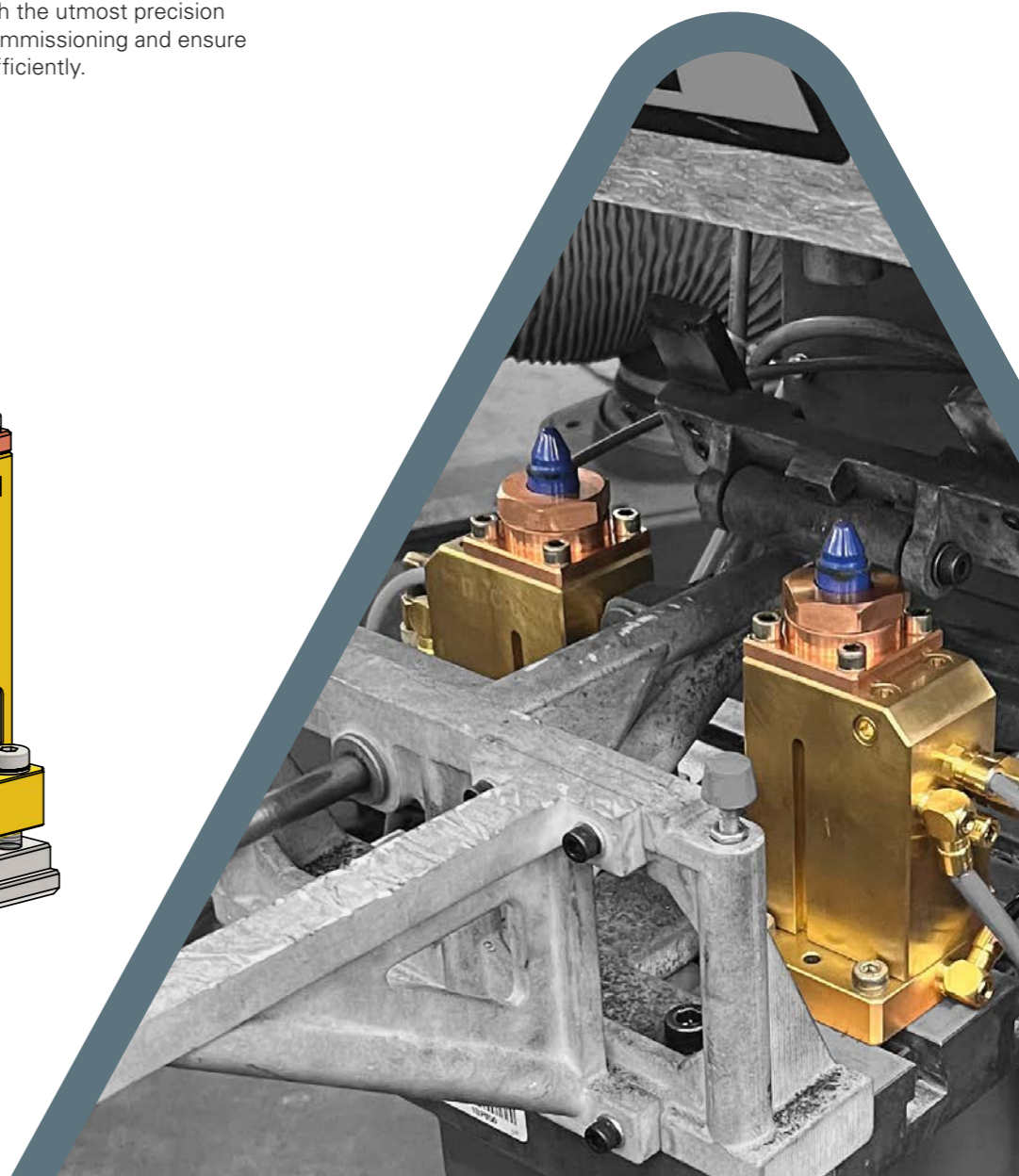
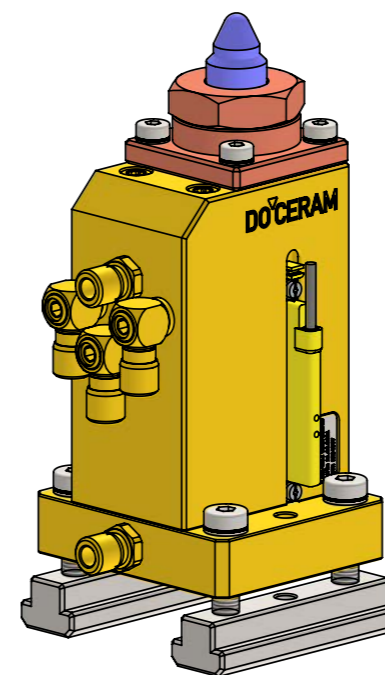
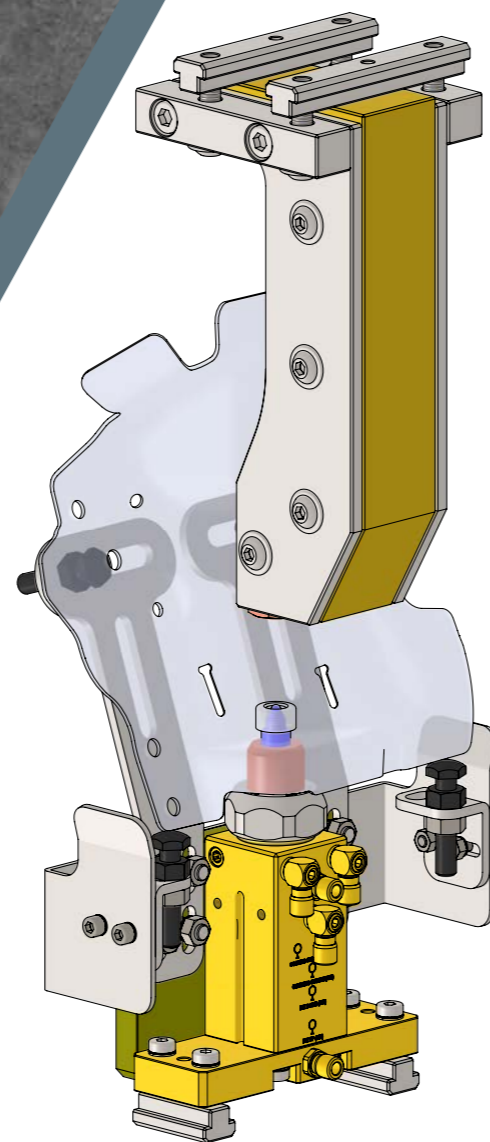
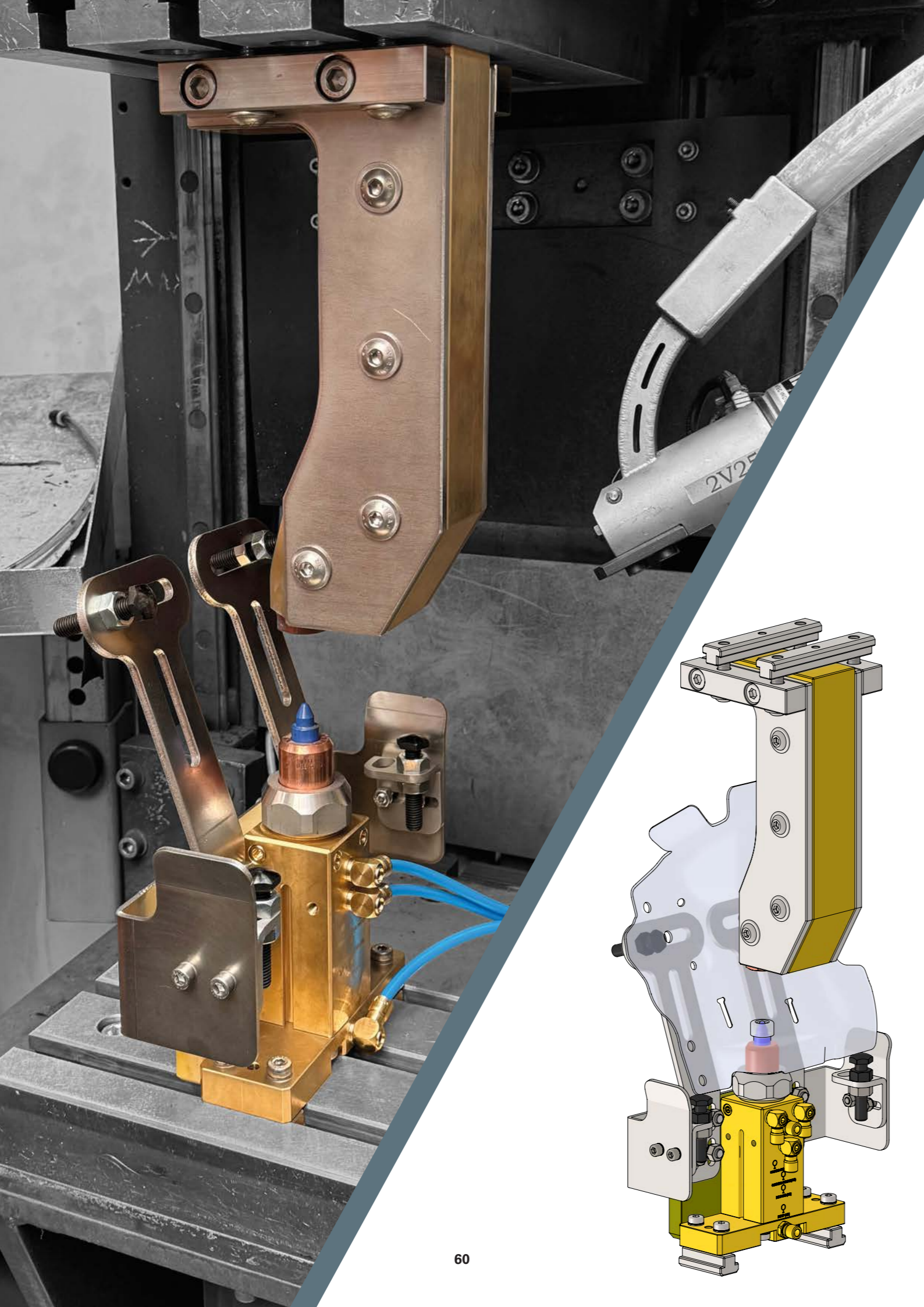
Leverage the concentrated expertise of our team to tackle your tasks with customized welding tools that excel in terms of safety, performance and durability.

We would be happy to visit you directly to gather all the relevant data. Based on this information, we create a customized design perfectly tailored to your requirements. After thorough planning, we produce the design with the utmost precision and quality. Finally, we handle the commissioning and ensure that everything runs smoothly and efficiently.

If you seek to overcome complex challenges in your welding process, we would be pleased to assist you as a knowledgeable partner - from the initial sketch to the final solution.

Feel free to give us a call or write to us!

+49 231 92 50 00-444
technik@doceram.com



THE DOCERAM WELDING LABORATORY

YOUR COMPETENCE CENTER FOR INNOVATIVE WELDING TECHNOLOGY

The new DOCERAM welding laboratory is equipped with a purpose-built medium-frequency projection welding machine featuring a high-speed inverter and repositioning unit, offering comprehensive analysis options for common welding challenges. Our experienced team supports you with complex projects - from planning to the commissioning of intricate welding tools.

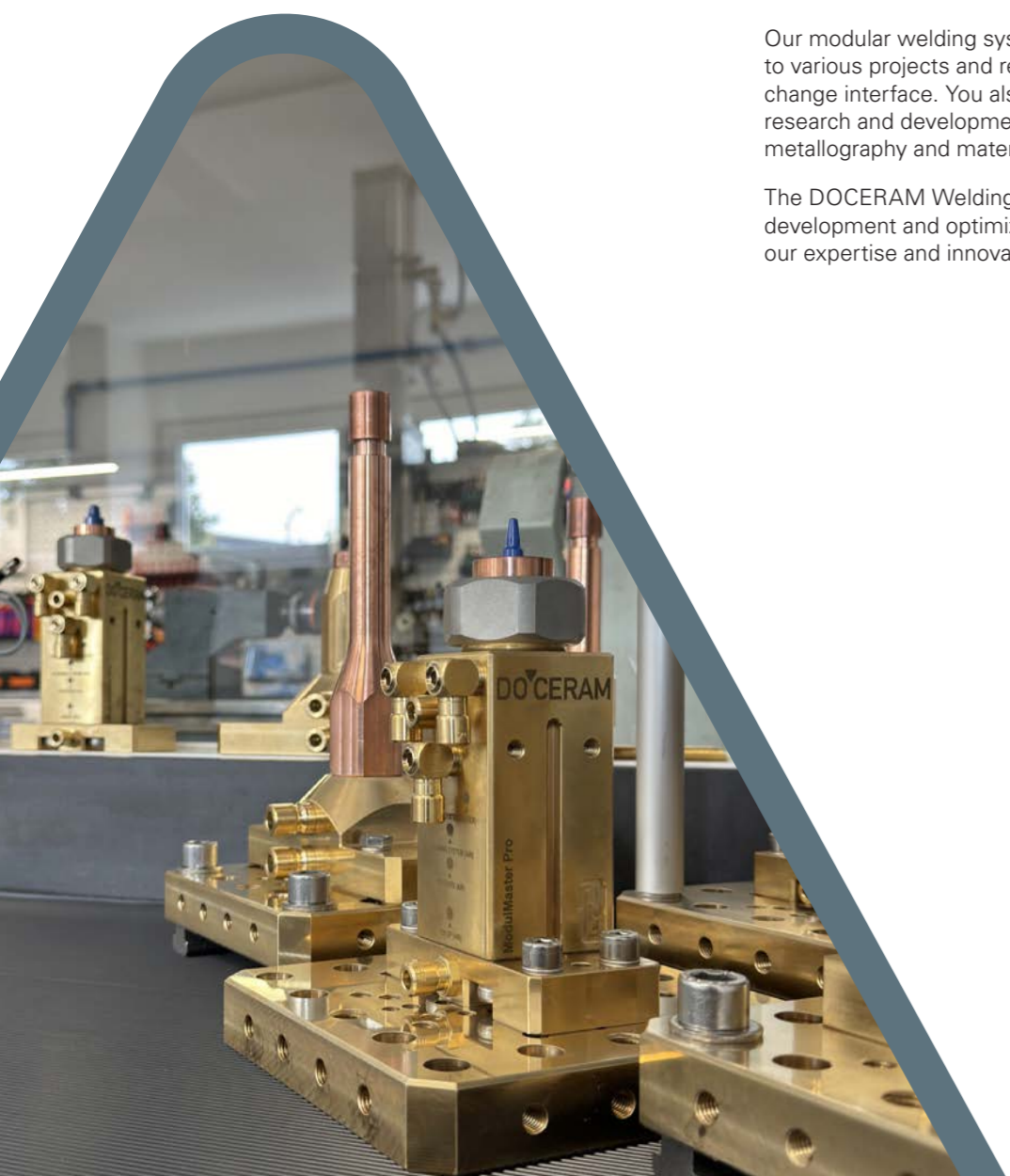
Service portfolio

Our welding laboratory covers a wide range of services, including:

- **Design and testing of welding tools:** In the DOCERAM welding laboratory, welding tools are precisely designed and subjected to extensive testing to ensure their performance and reliability across various applications.
- **Welding parameter determination:** We conduct systematic tests and analyses to identify optimum welding parameters, maximizing the quality of welded joints and streamline process sequences. This creates a foundation for a smooth production process in series manufacturing.
- **Welding of test pieces:** We manufacture test pieces and prototypes tailored to your application upon request.
- **Welding Technical Consultation:** For challenging applications, we support you with in-depth expertise and tailored solutions, which are tested in the laboratory beforehand.

Our modular welding system allows for flexible adaptation to various projects and requirements, thanks to our quick-change interface. You also benefit from our extensive research and development infrastructure, which includes metallography and materials testing.

The DOCERAM Welding Laboratory is your partner for the development and optimization of welding challenges. Rely on our expertise and innovative strength for your projects.



DID YOU KNOW...?

HIGH-PERFORMANCE CERAMICS AND INNOVATIVE INSULATION TECHNOLOGY - PERFECTION IN WELDING

In car body construction, precision in welding is crucial. Positioning and locating pins made of high-performance ceramics from DOCERAM ensure precise alignment of components. Compared to conventional steel pins, these ceramics easily withstand extreme stresses such as welding spatter and high temperatures. With service lives up to 20 times longer, they minimize interruptions and sustainably reduce process and maintenance costs.

DOCERAM and its sister company DOTHERM work hand in hand: while DOCERAM specializes in high-performance ceramics and welding technology, DOTHERM provides specialized solutions in insulation technology. One example of this is the heavy-duty screw head insulation, which impresses with its high compressive strength of up to 600 N/mm². Thanks to their exceptional material stability, these insulators

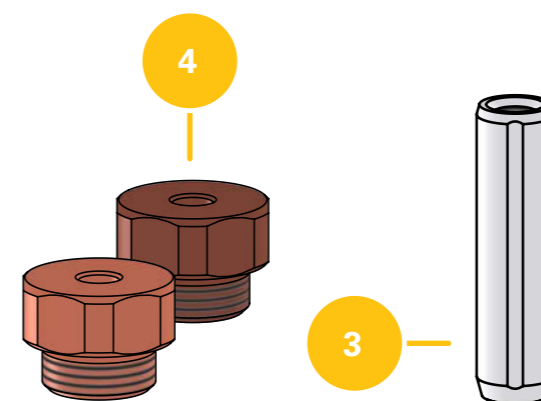
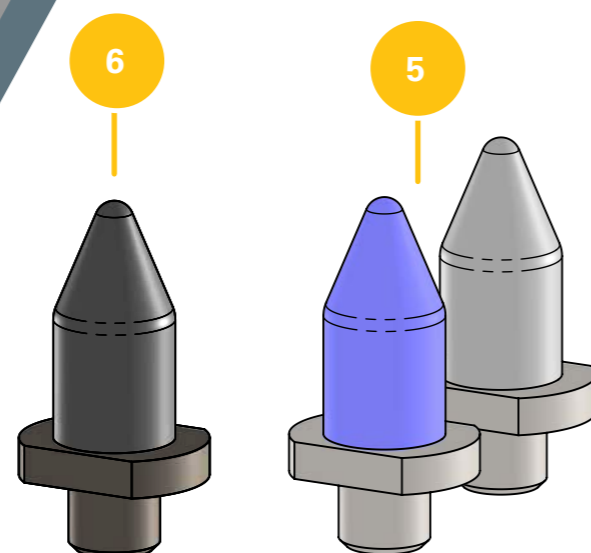
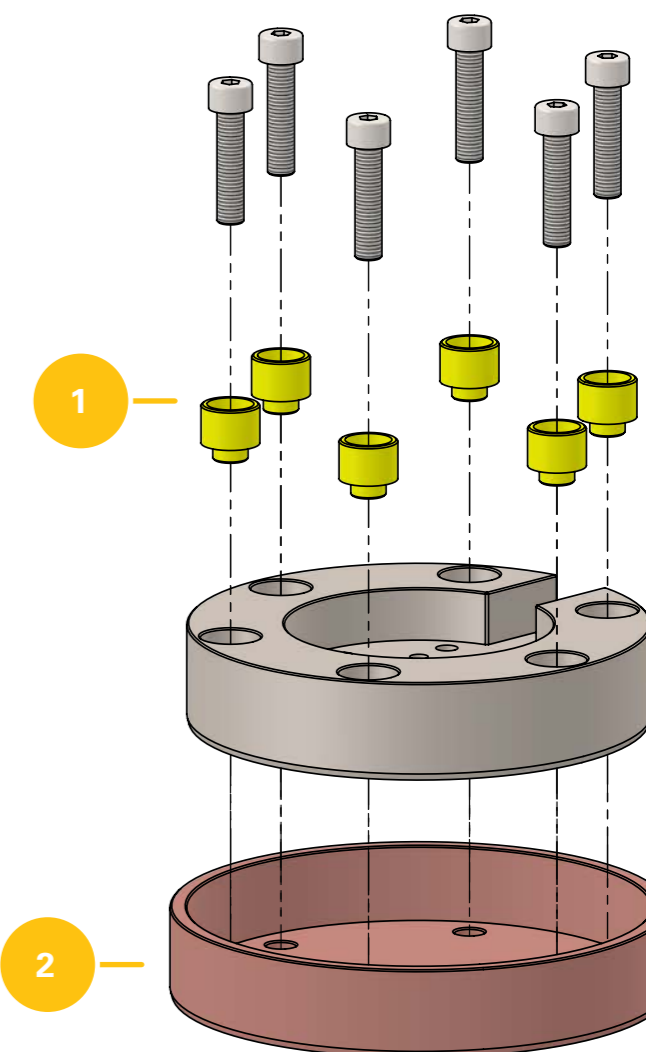
can be used at temperatures of up to 180°C despite their compact design, ensuring reliable insulation even in demanding welding processes.

Thanks to close cooperation within the Group, the two companies offer a wide range of high-performance materials to meet diverse requirements in industry.

Customers receive support from selecting the right material, through processing and customization to the provision of tailor-made solutions for specific requirements.

A small selection of our materials and their areas of application in resistance projection welding:

1. DOGLAS 180G - screw head insulation
2. FRATHERNIT AE4 - welding head insulation
3. Z-101 - dowel pins
4. Copper (2.1293 or 2.1285) - electrodes
5. Cerazur or Volcera - locating pins
6. DLC-Coating - locating pins



DOCERAM LOCATING PINS

QUALITY FROM HEAD TO TOE

DOCERAM locating pins meet the highest mechanical demands and offer versatile combination options for various requirements.

The components are connected using a new joining technique that is specifically tailored to the geometries of the head and base.

We are also available to assist you with any request for customized solutions.

1. ALL-CERAMIC HEAD

Choose the right geometry for your full-ceramic head made of DOCERAM Cerazur:

- **AH** (Angular Head)
- **CH** (Circular Head)
- **F-AH** (Flat Angular Head)

The geometries can be produced in the following shape:

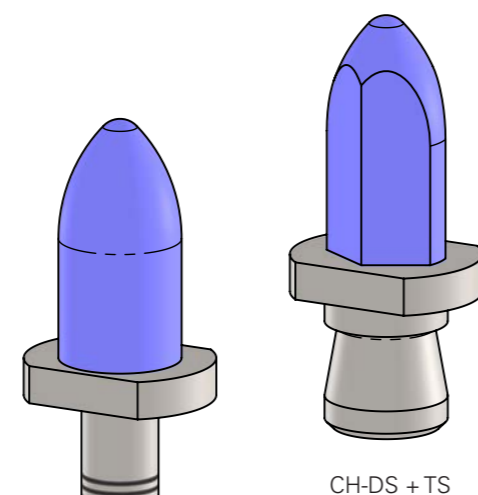
- **RS** (Round Shaped)
- **DS** (Diamond Shaped)

DOCERAM POSITIONING PINS ARE ALSO AVAILABLE IN A HARDENED VERSION WITH A DLC COATING.

2. STAINLESS STEEL BASE

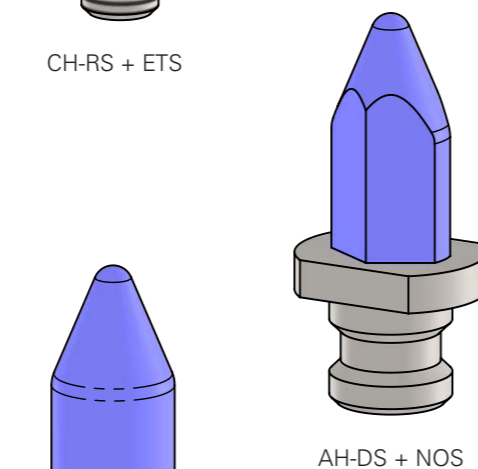
To match your head geometry, we offer the following base geometries made of stainless steel (1.4305) to suit your head geometry:

- **ETS** (External Threaded Shank)
- **ITS** (Internal Threaded Shank)
- **TS** (Tapered Shank)
- **NOS** (Notched Shank)



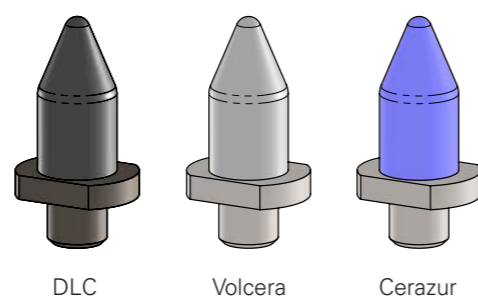
CH-RS + ETS

CH-DS + TS



AH-RS + ITS

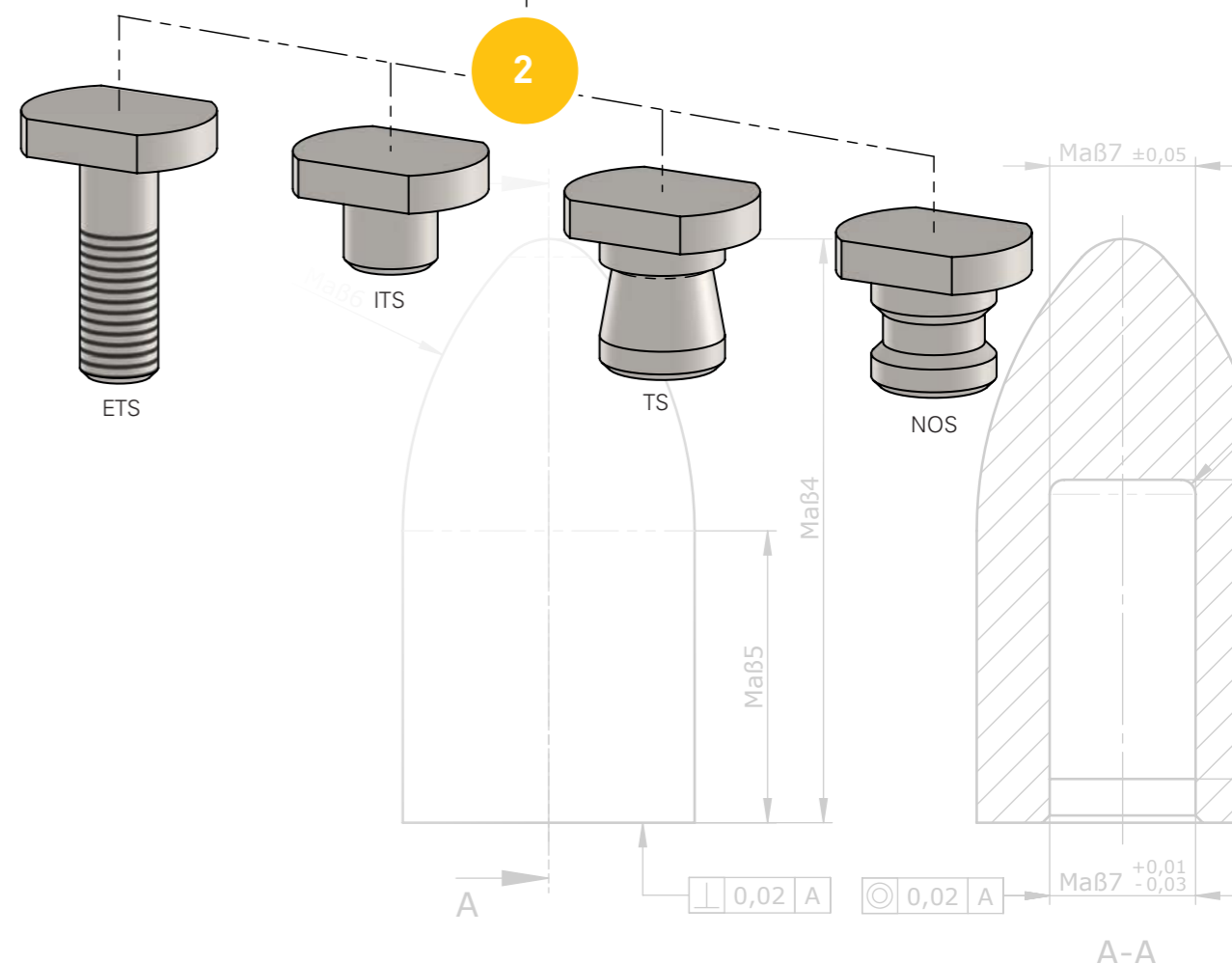
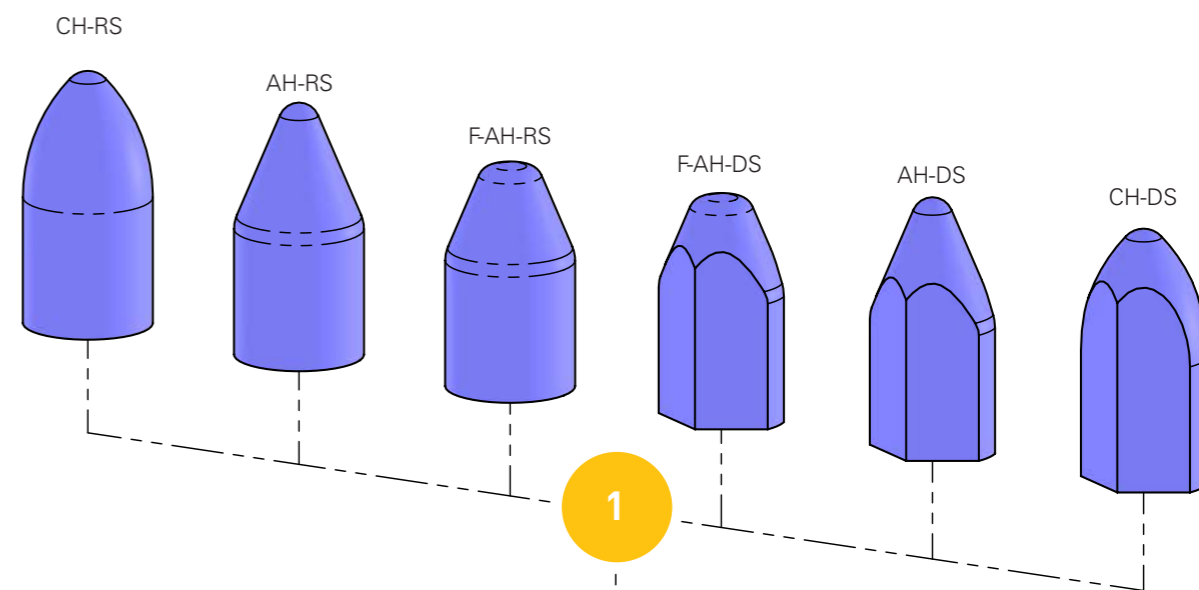
AH-DS + NOS



DLC

Volcera

Cerazur



CONFIGURABLE STANDARD

CUSTOMIZED TUNING

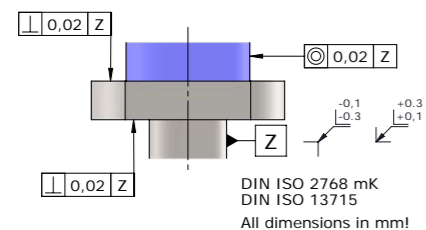
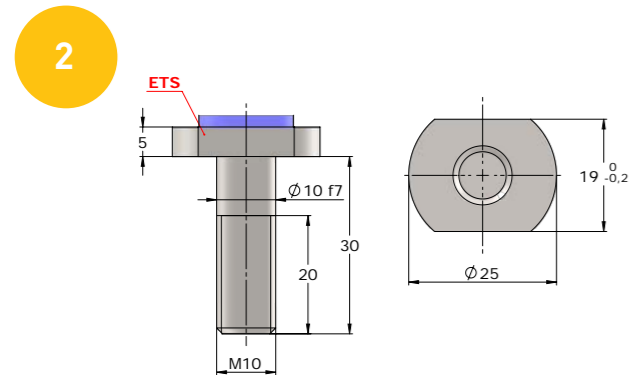
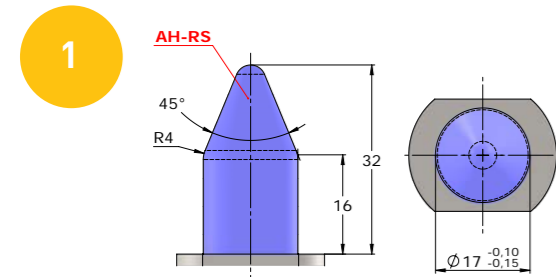
The configurable standard locating pin can be manufactured to your specific dimensions.

You no longer need a drawing to place an order - simply order your configured standard locating pin in just a few steps:

- Select the appropriate ceramic head (1) along with the desired stainless steel base (2), and specify the required dimensions (see table and drawings).
- Indicate the desired quantity.
- Send us an email at info@doceram.com with the information.

EXAMPLE

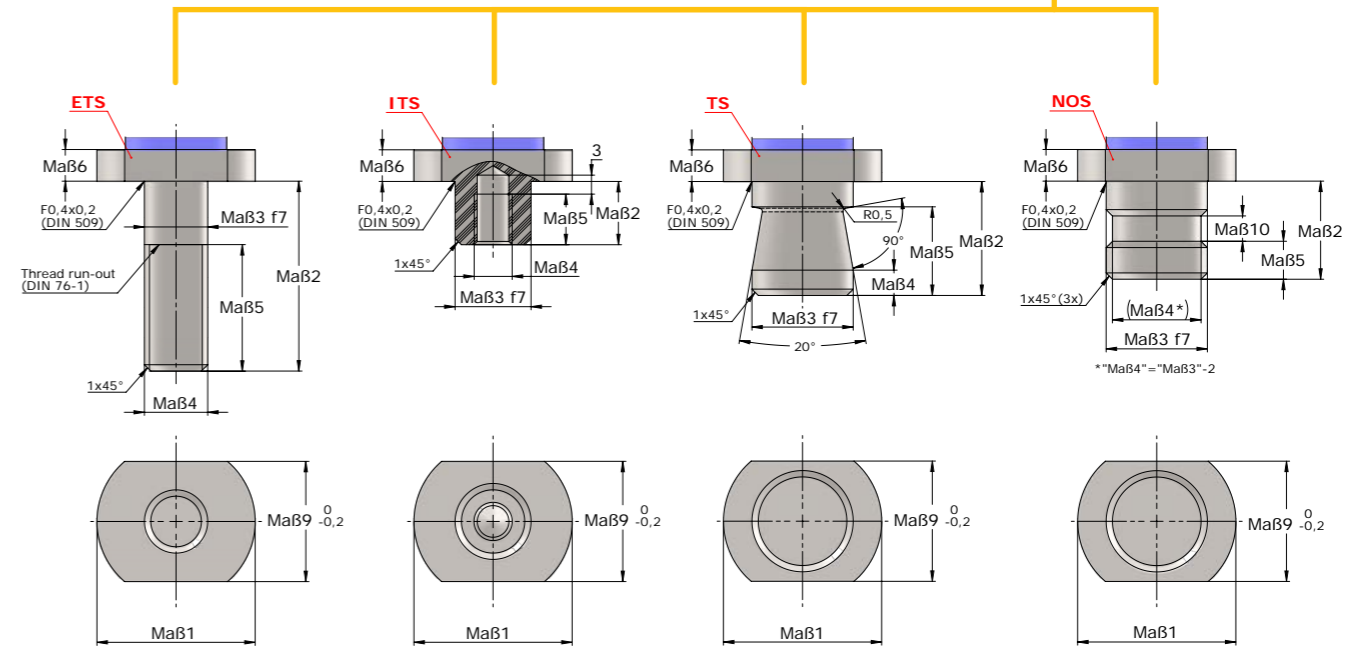
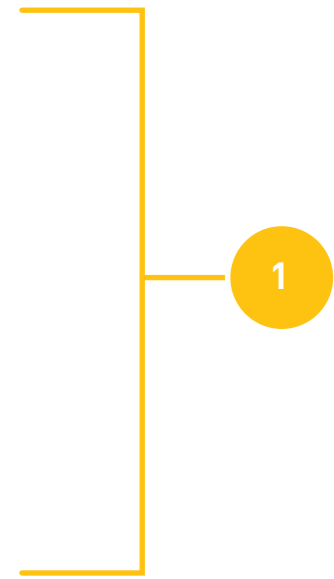
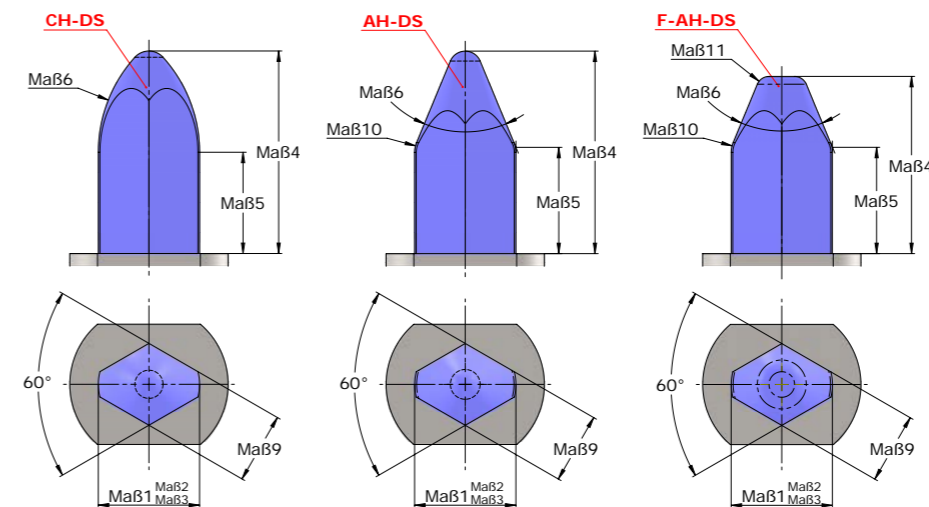
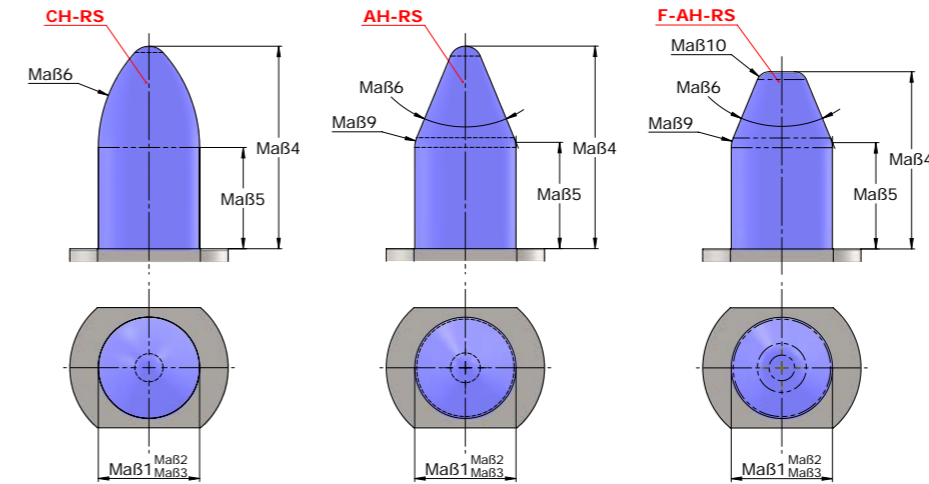
Example order details							
Head	Maß 1	Maß 2	Maß 3	Maß 4	Maß 5	Maß 6	Maß 9
AH-RS	17	-0,10	-0,15	32	16	45°	R4
Base	Maß 1	Maß 2	Maß 3	Maß 4	Maß 5	Maß 6	Maß 9
ETS	25	30	10	M10	20	5	19



DIMENSIONS TO BE SPECIFIED

1. Ceramic configuration						
Maß	CH-RS	AH-RS	F-AH-RS	CH-DS	AH-DS	F-AH-DS
Maß 1	x	x	x	x	x	x
Maß 2	x	x	x	x	x	x
Maß 3	x	x	x	x	x	x
Maß 4	x	x	x	x	x	x
Maß 5	x	x	x	x	x	x
Maß 6	x	x	x	x	x	x
Maß 9	-	x	x	x	x	x
Maß 10	-	-	x	-	x	x
Maß 11	-	-	-	-	-	x

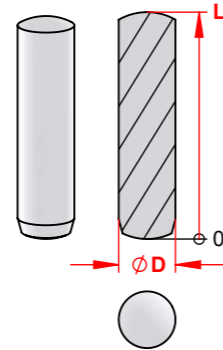
2. Base configuration				
Maß	ETS	ITS	TS	NOS
Maß 1	x	x	x	x
Maß 2	x	x	x	x
Maß 3	x	x	x	x
Maß 4	x	x	x	x
Maß 5	x	x	x	x
Maß 6	x	x	x	x
Maß 9	x	x	x	x
Maß 10	-	-	-	x



DOWEL PINS

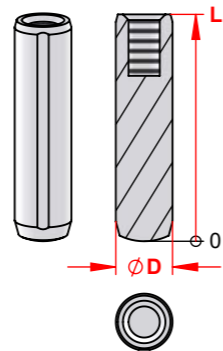
DOWEL PIN MADE FROM Z101, DIN EN ISO 8734 (FORMERLY DIN 6325)

D	L	Item No.	D	L	Item No.	D	L	Item No.
2,0	6	8221ZK13019	5,0	16	8221ZK13059	8,0	24	8221ZK13084
2,0	8	8221ZK13020	5,0	18	8221ZK13060	8,0	32	8221ZK13086
2,0	10	8221ZK13021	5,0	20	8221ZK13061	8,0	40	8221ZK13088
2,0	12	8221ZK13022	5,0	24	8221ZK13062	8,0	50	8221ZK13090
2,0	14	8221ZK13023	5,0	28	8221ZK13063	8,0	60	8221ZK13092
3,0	10	8221ZK13037	5,0	32	8221ZK13064	8,0	70	8221ZK13093
3,0	12	8221ZK13038	5,0	36	8221ZK13065	10,0	24	8221ZK13095
3,0	14	8221ZK13039	6,0	14	8221ZK13069	10,0	32	8221ZK13097
3,0	18	8221ZK13041	6,0	18	8221ZK13071	10,0	40	8221ZK13099
3,0	20	8221ZK13042	6,0	20	8221ZK13072	10,0	50	8221ZK13101
3,0	28	8221ZK13044	6,0	24	8221ZK13073	10,0	60	8221ZK13103
3,0	32	8221ZK13045	6,0	28	8221ZK13074	10,0	70	8221ZK13104
4,0	10	8221ZK13046	6,0	32	8221ZK13075	10,0	90	8221ZK13106
4,0	12	8221ZK13047	6,0	36	8221ZK13076	12,0	28	8221ZK13108
4,0	16	8221ZK13049	6,0	40	8221ZK13077	12,0	40	8221ZK13111
4,0	18	8221ZK13050	6,0	50	8221ZK13079	12,0	60	8221ZK13115
4,0	20	8221ZK13051	6,0	60	8221ZK13081	14,0	40	8221ZK13121
4,0	28	8221ZK13053	8,0	18	8221ZK13082			
4,0	32	8221ZK13054	8,0	20	8221ZK13083			



DOWEL PIN MADE FROM Z101, DIN EN ISO 8735 (FORMERLY DIN 7979)

D	L	Item No.	D	L	Item No.	D	L	Item No.
6,0	14	8221ZK23069	8,0	18	8221ZK23082	10,0	40	8221ZK23099
6,0	18	8221ZK23071	8,0	20	8221ZK23083	10,0	50	8221ZK23101
6,0	20	8221ZK23072	8,0	24	8221ZK23084	10,0	60	8221ZK23103
6,0	24	8221ZK23073	8,0	32	8221ZK23086	10,0	70	8221ZK23104
6,0	28	8221ZK23074	8,0	40	8221ZK23088	10,0	90	8221ZK23106
6,0	32	8221ZK23075	8,0	50	8221ZK23090	12,0	28	8221ZK23108
6,0	36	8221ZK23076	8,0	60	8221ZK23092	12,0	40	8221ZK23111
6,0	40	8221ZK23077	8,0	70	8221ZK23093	12,0	60	8221ZK23115
6,0	50	8221ZK23079	10,0	24	8221ZK23095	14,0	40	8221ZK23121
6,0	60	8221ZK23081	10,0	32	8221ZK23097			



SCREW HEAD INSULATION

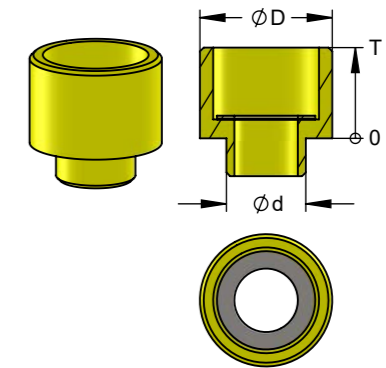
MADE OF DOGLAS 180 G

Pressure-resistant screw head insulation made from the high-performance insulating material DOGLAS 180 G for hexagon socket screws.

- Compressive strength 600 N/mm² at 20° C
- Duroplast, no flow under pressure
- Can resist temperatures up to max. 180° C
- Small design due to high material stability"

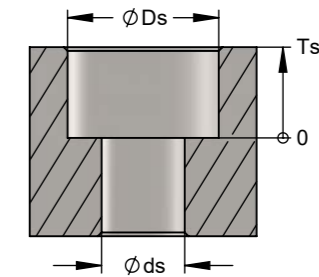
SCREWS INSULATING BUSHES

For screw	d	D	T	Item No.
M5	7,5	13,0	9,0	1462Z93653
M6	8,5	14,5	10,0	1462Z93655
M8	10,5	17,5	12,0	1462Z93657
M10	12,5	20,5	14,0	1462Z93658
M12	14,5	22,5	16,0	1462Z93659



RECOMMENDATION FOR COUNTERBORE

For insulating bush	ds	Ds	Ts
M5	8,0	14,0	9,0
M6	9,0	18,0	10,0
M8	11,0	20,0	12,0
M10	13,0	24,0	14,0
M12	15,0	26,0	16,0



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