

# DZ-MM SERIES EFFUSION CELLS

## TAILORED FOR EVAPORATION OF HIGH PRESSURE METALS & COMPOUNDS

THE MM TECHNOLOGY FOR :

Cd, Mg, Zn, Te, Sr, Yb, Ca, CdTe, ZnTe, Bi, Pb, etc.



- High loading capacity
- Easy maintenance and re-filling operations
- Uniformity of thickness independent of the filling level
- Virtually eliminates flux drift due to filling level
- Spitting free material effect
- Loaded charge is protected from corrosive or oxidizing environments

The MM technology is specifically used for **the evaporation of high pressure metals and compounds**. The material is loaded into a PBN crucible and an insert is fitted into the mouth. The contours and design of the effusion orifice pattern on the insert define the shape of the flux beam. **The customized design** of the insert allows either narrow or wide beam distribution, enabling the achievement of very high uniformity. **The thermal gradient of the oven** prevents from any clogging effect during the operation.

**The insert design** improves reliability, significantly **lowers the rapid beam fluctuation** and **enhances the stability of flux values** and the deposition rate over runs. In addition, the DZ-MM insert design **eliminates corrosion of the loaded material** when used in a corrosive environment such as oxygen, selenium, etc. **The maintenance and refilling procedures** are **straightforward** and **easy to accomplish**.

# SPECIFICATIONS

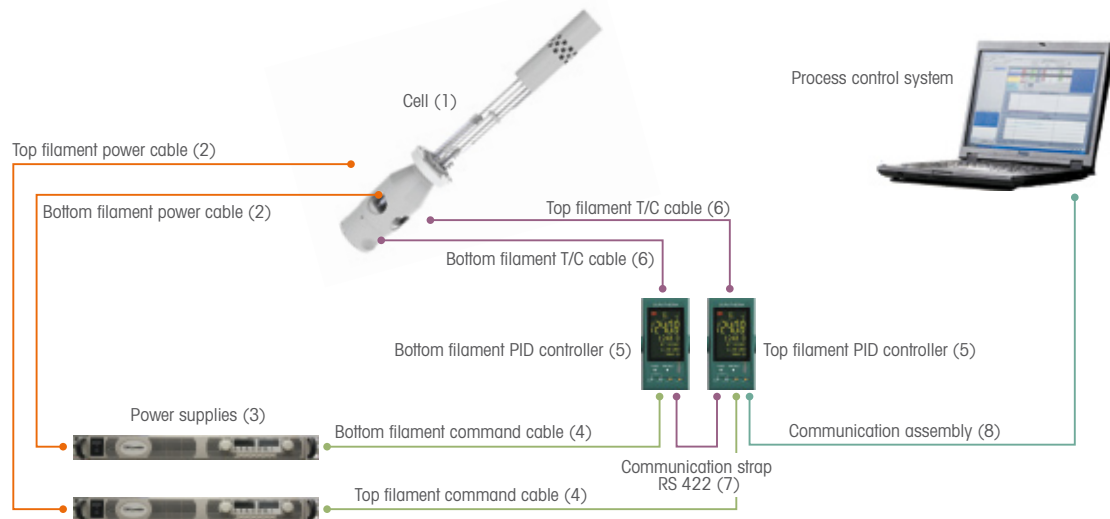
## SCHEMATIC OF THE DISASSEMBLED VIEW



## CHARACTERISTICS

CELL MODEL	S40 DZMM28		S63 DZMM85	S80 DZMM300
Filament	Double			
Heating filaments	Wire			
Thermocouple	K-Type			
Crucible/Insert	PBN/Ta or PG			
Mounting flange (min)	CF40 (2.75")	CF63 (4.5")	CF100 (6")	
Typical operating temperature	100°C - 950°C			
Maximum continuous operating temperature	1050°C			
Maximum outgassing temperature	1100°C			
Temperature stability	+/-0.2°C			
WATER / GAS / ELECTRICAL				
Power consumption	300W / 300W	350W / 350W	500W / 500W	
Power supply recommended	2x(40V-19A)	2x(40V-19A)	2x(40V-19A)	
Power output connector	M-SockØ5	M-SockØ3	M-SockØ5	
Thermocouple connector	HMPW-K-M			
Water connection	Swagelok fitting Ø3 female			
Pneumatic connection	Ø4mm tube fitting			
OPTIONS				
Integrated water shielding	Contact Riber			
Integrated shutter & water shielding				
Nipple shutter	Yes	N.A		

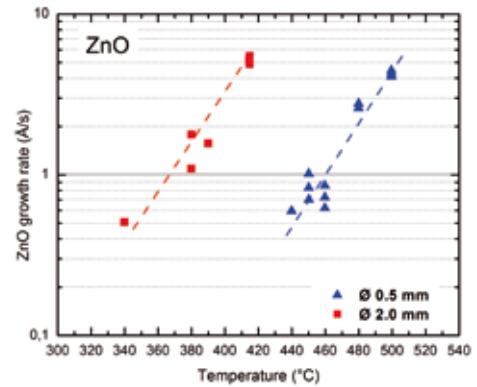
# OPERATING THE SOURCE



# RESULTS

## ZnO deposition rate versus crucible bottom temperature

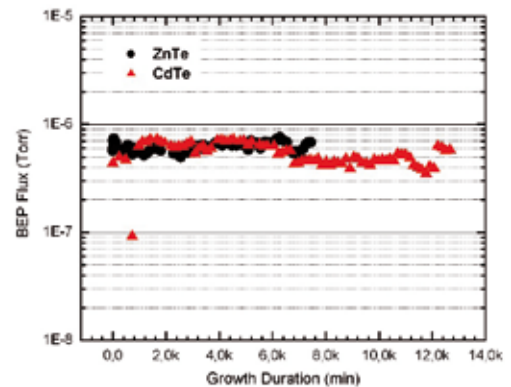
The shape of the insert end changes the working conditions of the cell. It increases the hole diameter while lowering the working temperature and the pressure in the crucible.



## Beam equivalent pressure of Zn over a II - Te growth

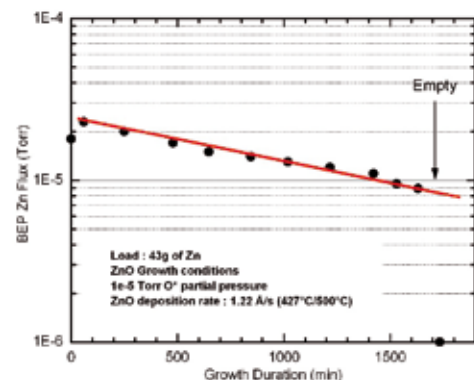
Compared to an open crucible, the insert restricts the source's effusion area.

Consequently, the pressure over the load is higher than in a standard open crucible effusion source. It provides a much stable flux, because this one is independent from the filling level and / or the evaporation area.



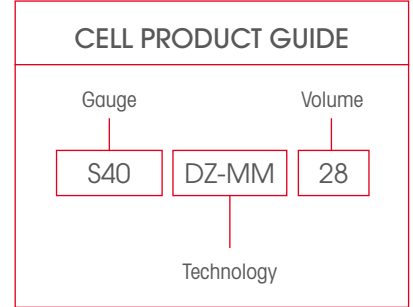
## Beam equivalent pressure of Zinc over a ZnO growth

Growth of ZnO crystal is performed under  $3 \times 10^{-5}$  Torr of oxygen species (Plasma sources). Zinc is evaporated with a S63-DZ-MM (load 43gr). MM technology prevents from the oxidation of the load by oxygen residual pressure in the chamber as it happens after one or two runs with a usual open crucible effusion cell.



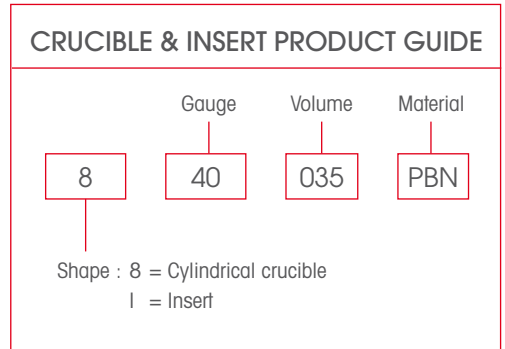
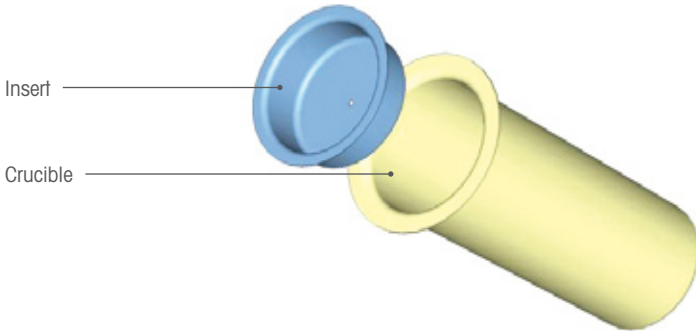
# ORDERING INFORMATION

## CELL



CELL MODEL	P.N.	H2O	FLANGE	I.V.L.	O.L.	O.D.
S 40 DZ-MM 28 Ri	R235 029 1	No	CF 40	Please contact Riber		
S 63 DZ-MM 85 Ri	R235 053 0	No	CF 63			
S 63 DZ-MM 85 VG	R235 106 4	Yes	CF 63			
S 80 DZ-MM 300 Ri	R235 077 9	No	CF 100			
S 80 DZ-MM 300 VG	R235 106 5	Yes	CF 100			

## CRUCIBLES & INSERTS



CELL MODEL	CRUCIBLE	P.N.	INSERT	P.N.
S 40 DZ-MM 28 Ri	8 40 035 PBN	R330 009 0	I 40 035 Ta D0.7	R330 083 0
			I 40 035 Ta D1.0	R330 057 3
			I 40 035 PG D1.0	R330 156 5
			I 40 035 Ta D2.0	R330 081 9
S 63 DZ-MM 85 Ri/VG	8 63 125 PBN	R330 043 5	I 63 125 Ta 1.0	R307 167 3
			I 63 125 PG 1.0	R330 301 3
			I 63 125 Ta D2.0	R330 064 0
			I 63 125 PG D2.0	R330 110 8
S 80 DZ-MM 300 Ri/VG	8 80 300 PBN	R330 043 6	I 80 300 Ta D2.5	R330 301 5
			I 80 300 PG D2.5	R330 254 9

# SOURCE SELECTION GUIDE

SYSTEMS	SOURCE MODEL	S40 DZMM 28	S63 DZMM 85	S80 DZMM 300
RIBER	MBE 32	RECOMMENDED	INAPPROPRIATE	INAPPROPRIATE
	Compact 12	RECOMMENDED	INAPPROPRIATE	INAPPROPRIATE
	Compact 21	RECOMMENDED	RECOMMENDED	INAPPROPRIATE
	EPINEAT	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS	RECOMMENDED
	MBE 412 (4"/6")	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS	RECOMMENDED
	MBE 49	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS
	MBE 6000	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS
	MBE 7000	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS
VEECO / VARIAN	GEN II	RECOMMENDED	INAPPROPRIATE	INAPPROPRIATE
	MOD GEN II	RECOMMENDED	INAPPROPRIATE	INAPPROPRIATE
	GEN 930	CONTACT RIBER FOR MORE DETAILS	RECOMMENDED	INAPPROPRIATE
	GEN 10	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS
	GEN 20	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS
	GEN 200	CONTACT RIBER FOR MORE DETAILS	RECOMMENDED	RECOMMENDED
	GEN 2000	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS	RECOMMENDED
VG	V80	RECOMMENDED	RECOMMENDED	INAPPROPRIATE
	V90	RECOMMENDED	RECOMMENDED	INAPPROPRIATE
	V100	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS	RECOMMENDED
	V150	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS	CONTACT RIBER FOR MORE DETAILS
OTHER SYSTEMS		Riber sources are also available for use on systems from Elko, Anelva, Ulvac, SVTA and DCA, as well as customs chambers. Contact Riber for details.		

 RECOMMENDED

 CONTACT RIBER FOR MORE DETAILS

 INAPPROPRIATE

## TECHNOLOGICAL LEADERSHIP

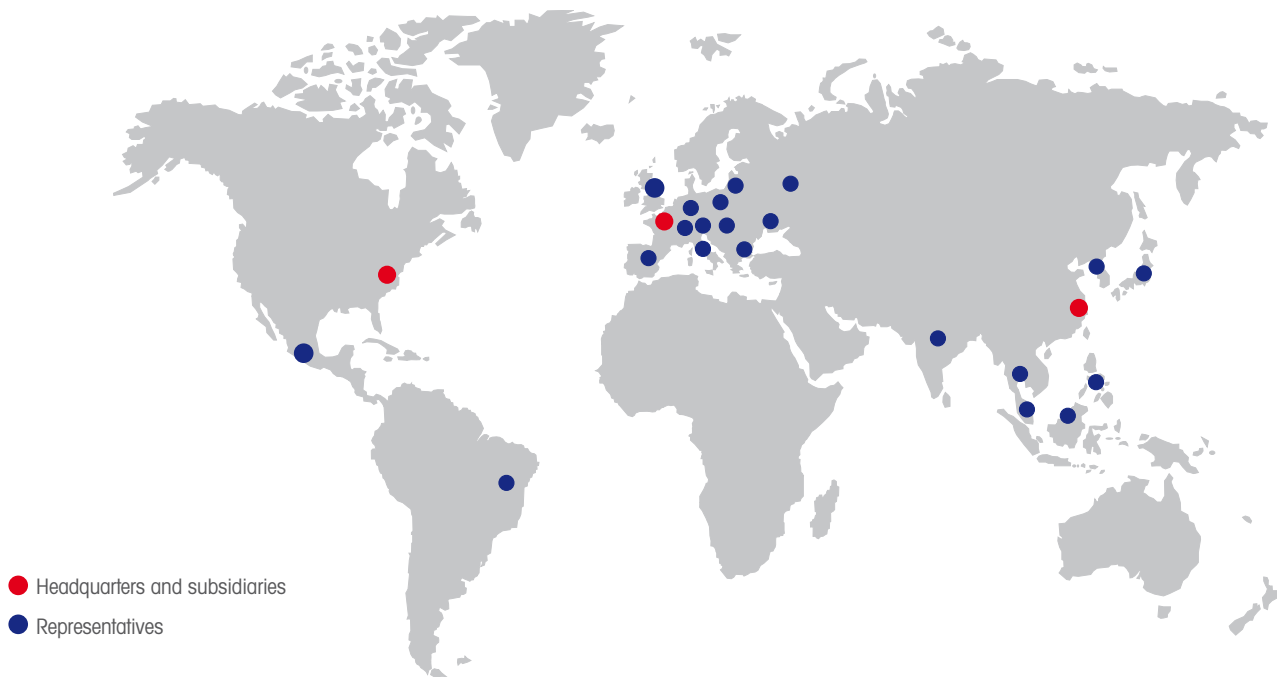
Riber is the world leading supplier of MBE processing equipment and related services.

In total, 850 of our MBE systems have been installed with at least one system in each of the 35 countries with which MBE is involved. This represents 75% of the global market.

Capitalizing on more than 30 years of experience, the company's core philosophy is to design systems in close association with customers. Riber has invented and designed major features which are now found in all MBE systems.

Riber plays a key role in the development of MBE technology, providing customers with solutions from equipment to epitaxial growth.

## WORLDWIDE PRESENCE



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