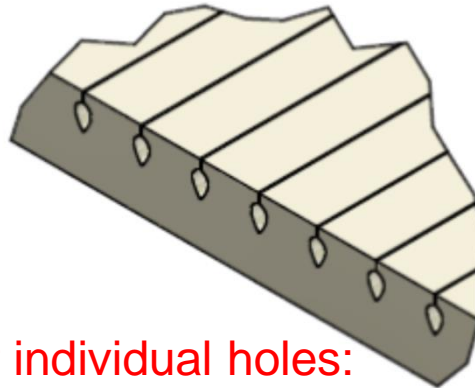
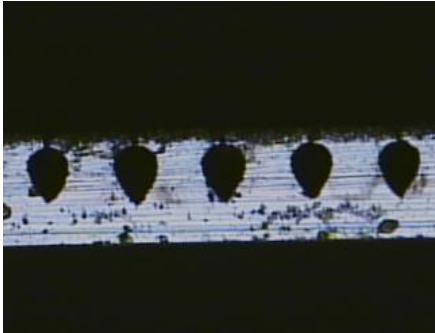


Silicon buried channels @ FBK

Past experience

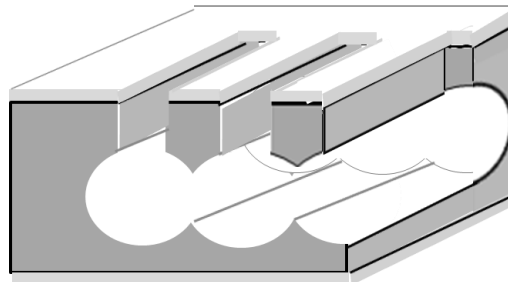
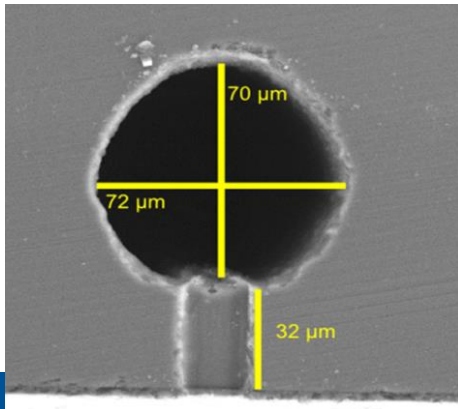
Channels made with individual holes:

The section is determined by the DRIE process, the length by the layout

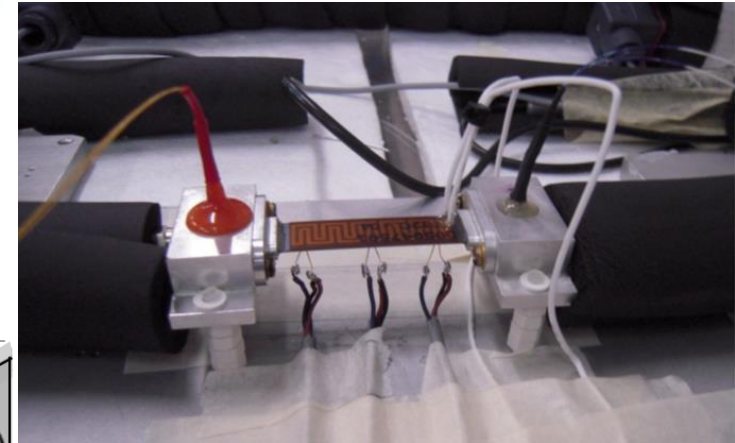


Channels realized as a sum of individual holes:

The section is determined by the process and by layout, the length by the geometry

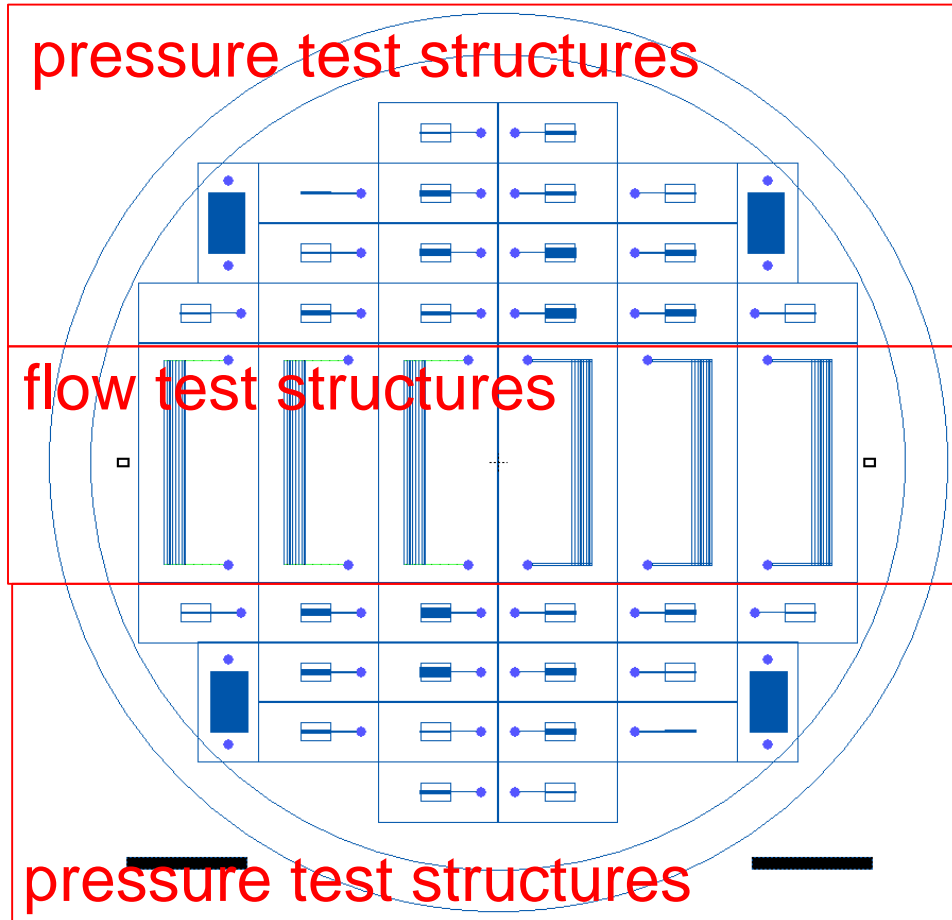


Experimental results made in the lab TFD INFN of Pisa show a general compliance of the temperature of the sample to the specific fixed at least up to a power of about 2.5 W/cm^2 .



M. Boscardin et al.
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buried channels : wafer layout



Buried channel structures based on single channel with a 50µm of hydraulic diameter

Structures based on a combination of linear and transversal approach

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buried channels: device list

Description	Cell name	# of cells
Pressure Samples Longitudinal Single	1P_S_L_C5_WX_P25	2
Pressure Samples Longitudinal Single	2P_S_L_C5_WX_P50	2
Pressure Samples Longitudinal Single	3P_S_L_C9_WX_P25	2
Pressure Samples Longitudinal Single	4P_S_L_C9_WX_P50	2
Pressure Samples Longitudinal Ramified	5P_R_L_C11_WX_P75	2
Pressure Samples Longitudinal Ramified	6P_R_L_C11_WX_P100	2
Pressure Samples Longitudinal Ramified	7P_R_L_C11_WX_P150	2
Pressure Samples Transversal Single	8P_S_T12_C9_WX_P25	2
Pressure Samples Transversal Single	9P_S_T12_C9_WX_P50	2
Pressure Samples Transversal Ramified	10P_R_T12_C11_WX_P75	2
Pressure Samples Transversal Ramified	11P_R_T12_C11_WX_P100	2
Pressure Samples Transversal Ramified	12P_R_T12_C11_WX_P150	2
Pressure Samples Transversal Single	13P_S_T24_C5_WX_P50	2
Pressure Samples Transversal Ramified	14P_R_T24_C5_WX_P75	2
Pressure Samples Transversal Ramified	15P_R_T24_C5_WX_P100	2
Pressure Samples Transversal Ramified	16P_R_T24_C5_WX_P150	2
Flow Samples Combined	17F_C_L_C8_W50	3
Flow Samples Combined	18F_C_T_C8_W50	3
TEST CHIP		4
	TOTAL	42

T12/T24 indicates the use of a trench with a size of 4x12 or 4x24 micron

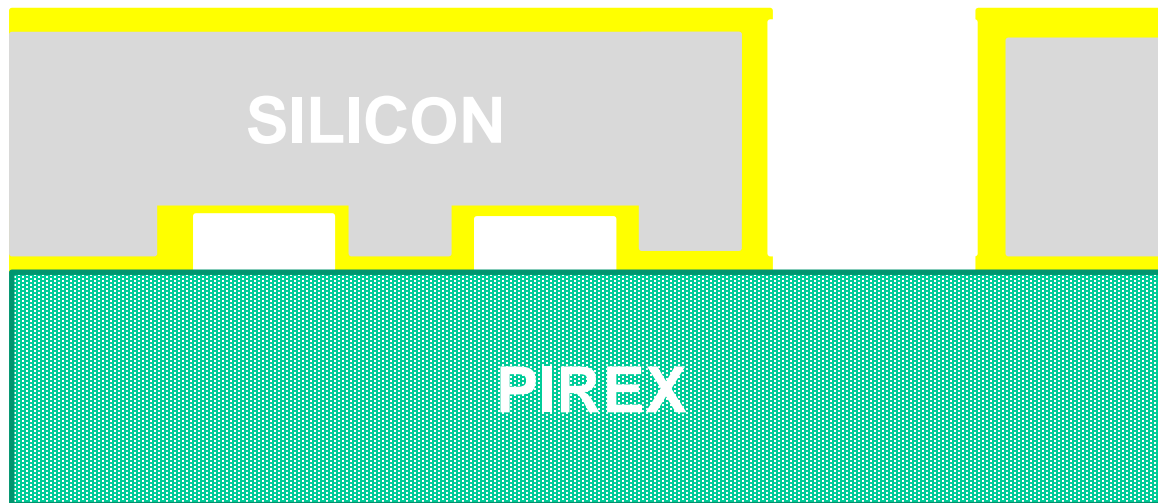
C5/C9/C11 is the number of channels

P25/P50/P75/P100/P150 is the pitch value expressed in microns

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MICROCHANNEL & ANODIC BONDING

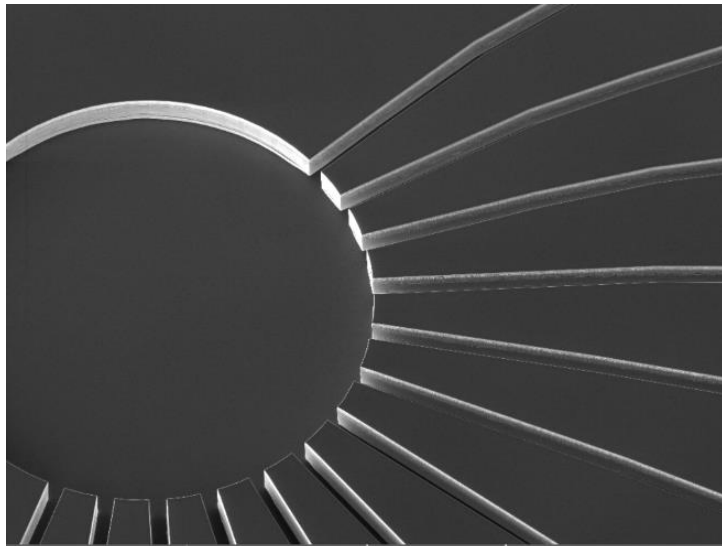
- Define channel and I/O holes in silicon wafers
- Anodic bonding with a PIREX wafer



In partnership with LPNHE

MICROCHANNEL & ANODIC BONDING

In partnership with LPNHE



SEM HV: 15.0 kV	WD: 26.42 mm	VEGA3 TESCAN
View field: 2.60 mm	Det: SE	500 µm
SEM MAG: 106 x	Date(m/d/y): 02/03/16	Performance in nanospace



SEM HV: 15.0 kV	WD: 26.52 mm	VEGA3 T
View field: 5.75 mm	Det: SE	1 mm
SEM MAG: 48 x	Date(m/d/y): 02/03/16	Performance in nanospa

