

Molecular orientation.

500 Class O-PVC TOM[®] pipes



**VOICE OF
THE DANUBE**

the water service sector platform

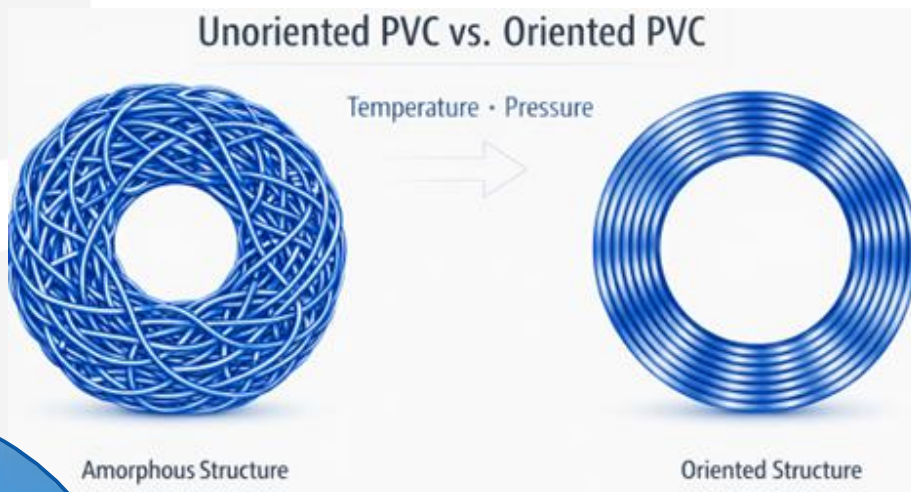
SOFIA, BULGARIA, MAY 2026



MOLECULAR ORIENTATION. THE PVC REVOLUTION

Molecular Orientation Principle

- Physical process that modifies the molecular structure

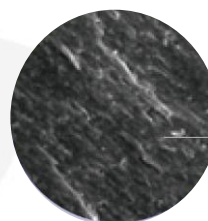
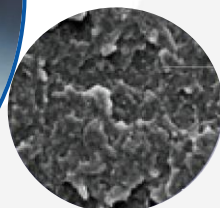


NO CHANGE IN THE PVC-U PIPE FORMULATION



Amorphous
Structure

Layered
Structure



PVC-U

Brittle Fracture



PVC-O Class 500

More defined layered structure



MOLECULAR ORIENTATION. THE PVC REVOLUTION

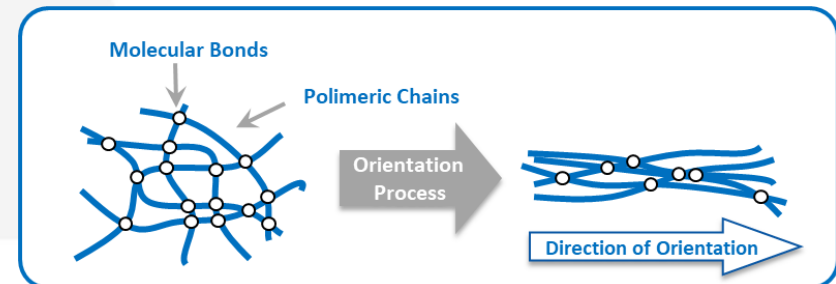
Throughout the 1970s and 80s, industrial processes were developed with the aim of improving the original properties of traditional polymers. (PVC)

The first proposals and procedures emerged that offered initial improvements to the mechanical qualities of PVC.

This evolution was conditioned by its own production process due to the absence of global regulations. During those years, material classes 315, 355, 400, and 450 were introduced, their implementation authorized by specific local regulations, thus initiating a gradual evolution in the plastic pipe sector.

In this process of globalization where factors of energy efficiency, more demanding technical requirements and the need to contribute with sustainable solutions and materials are necessarily combined, a patented process is developed that allows obtaining the highest existing class of molecular orientation, Class 500, according to ISO 16422-2006 and subsequently EN 17176-2019.

Polyvinyl chloride (PVC) is essentially an amorphous polymer, in which the molecules are arranged randomly. However, by stretching the material under specific pressure, temperature, and speed conditions, it is possible to align the polymer molecules in the same direction as the stretching.



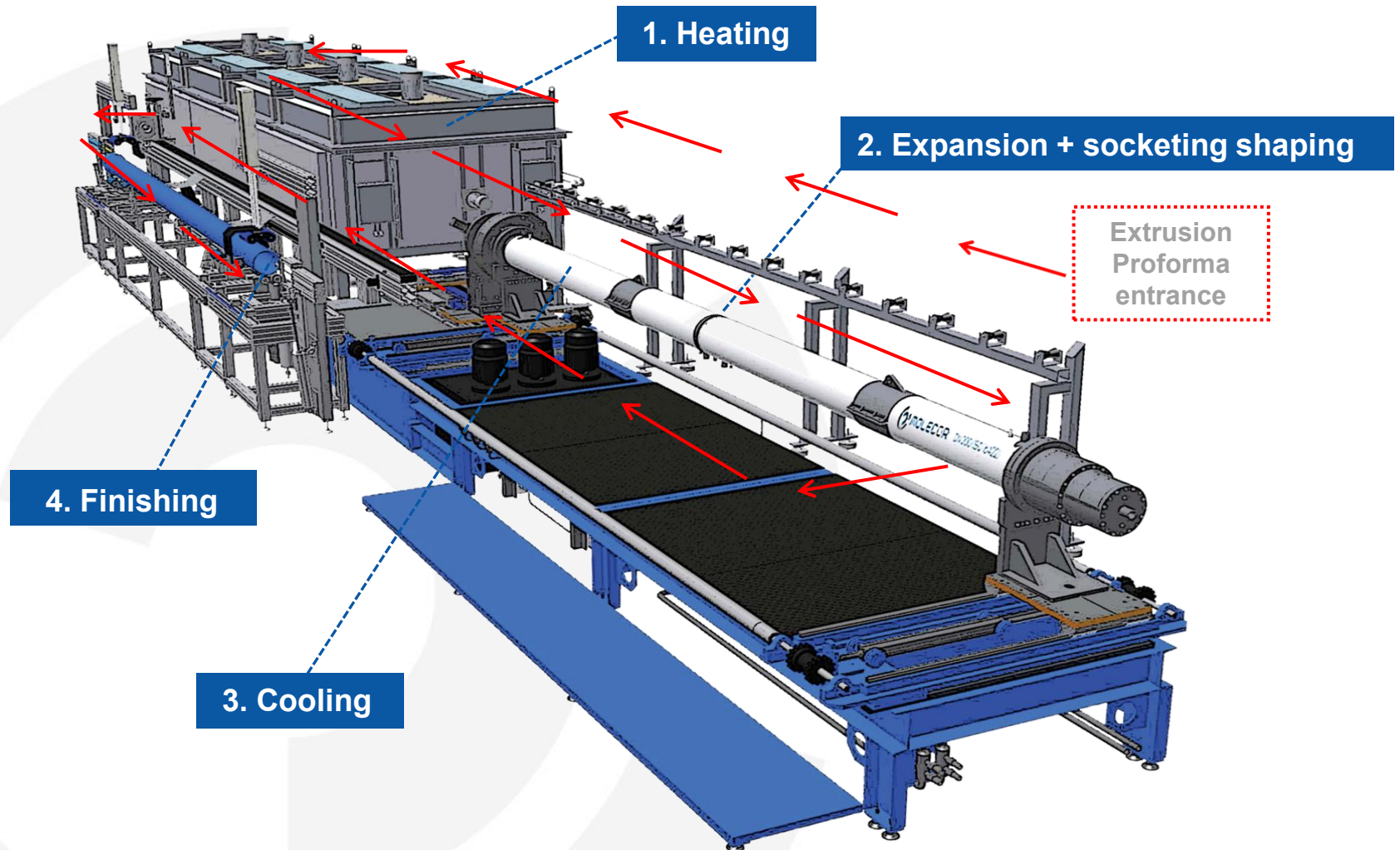
Depending on the process parameters, and primarily the orientation factor, certain characteristics are obtained in the final pipe.

The result is a plastic with a layered structure, whose layers are visible to the naked eye.

The Molecular Orientation process significantly improves the physical and mechanical properties of PVC, giving it exceptional characteristics without altering the advantages and chemical properties of the original polymer. This results in a plastic with unsurpassed tensile and fatigue strength, flexibility, and impact resistance.



MOLECOR PROCESS



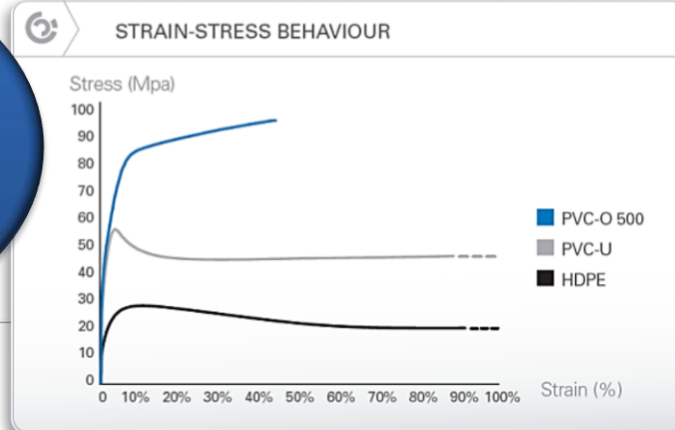
MAIN PROPERTIES

PVC-O Class 500 outstanding mechanical properties

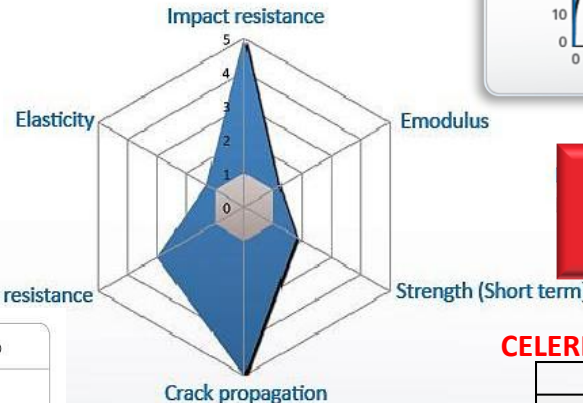
Physical process that modifies the molecular structure



**VERY LIGHT
AND
FLEXIBLE
MATERIAL**



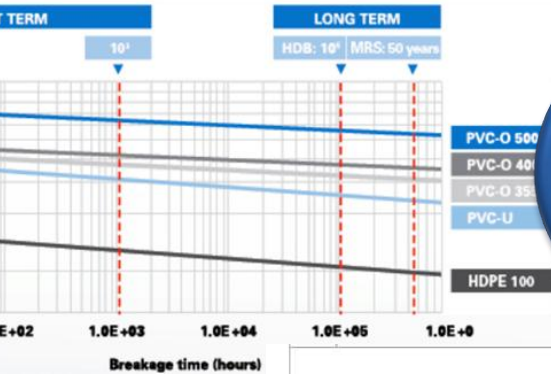
**IMPROVES ALL THE U-PVC
PROPERTIES**



**GREATER POWER OF
WATER HAMMER
ATTENUATION**

CELERITY

	E (kg/m2)	e (mm)	a (m/s)
D. Iron (k9)	170 x 10 ⁸	9	1095
Steel	210 x 10 ⁸	5	1011
GRP	20 x 10 ⁸	7	492
PVC-U (PN16)	3 x 10 ⁸	29,7	424
HDPE (PN16)	1x 10 ⁸	45,4	320
TOM500 PVC-O	4 x 10⁸	13	318



MRS	Coefficiente diseño	Esfuerzo de diseño
50 MPa	1.4	36 MPa

NO CRACK WITH HIGH STRESS CONCENTRATION IN PVC-O



PVC-O

