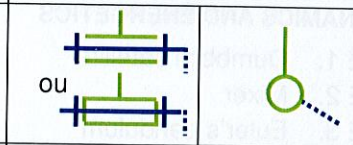
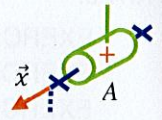
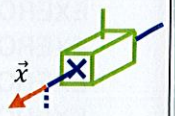
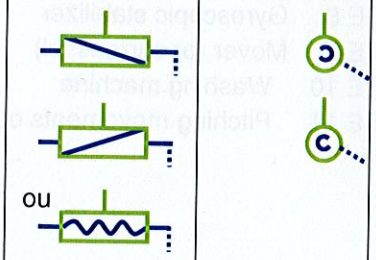
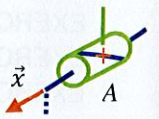
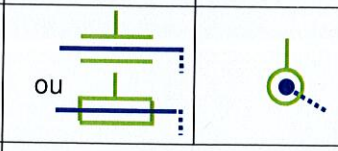
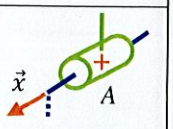
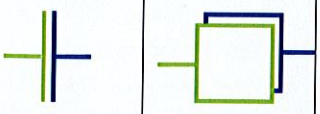
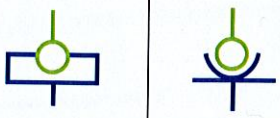
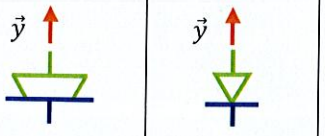
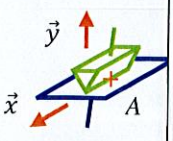
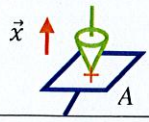
FORMULAR 1 Standard joints (reminder of 1st year)

joint	l_{ij}	m_{ij}	$\{\mathcal{V}\}$ – Kinematic wrench	$\{\mathcal{F}\}$ - Force wrench	Where ?	Plane representation	3D representation
Rigid	6	0	$\begin{Bmatrix}0 & 0\\0 & 0\\0 & 0\end{Bmatrix}_A$	$\begin{Bmatrix}X & L\\Y & M\\Z & N\end{Bmatrix}_A$	Everywhere		
Revolute of axis $(A,\vec{x})$	5	1	$\begin{Bmatrix}\omega_x & 0\\0 & 0\\0 & 0\end{Bmatrix}_A$	$\begin{Bmatrix}X & 0\\Y & M\\Z & N\end{Bmatrix}_A$	On the line $(A,\vec{x})$		
Prismatic of axis $\vec{x}$	5	1	$\begin{Bmatrix}0 & v_x\\0 & 0\\0 & 0\end{Bmatrix}_A$	$\begin{Bmatrix}0 & L\\Y & M\\Z & N\end{Bmatrix}_A$	Everywhere		
Helicoïd Screw joint of axis $(A,\vec{x})$ and thread p	5	1	$\begin{Bmatrix}\omega_x & v_x\\0 & 0\\0 & 0\end{Bmatrix}_A$ $v_x = k\omega_x$	$\begin{Bmatrix}X & L\\Y & M\\Z & N\end{Bmatrix}_A$ $L = -kX$	On the line $(A,\vec{x})$		
Translation and rotation are linked/dependant							
Cylindrical of axis $(A,\vec{x})$	4	2	$\begin{Bmatrix}\omega_x & v_x\\0 & 0\\0 & 0\end{Bmatrix}_A$	$\begin{Bmatrix}0 & 0\\Y & M\\Z & N\end{Bmatrix}_A$	On the line $(A,\vec{x})$		
Spherical of center A	3	3	$\begin{Bmatrix}\omega_x & 0\\\omega_y & 0\\\omega_z & 0\end{Bmatrix}_A$	$\begin{Bmatrix}X & 0\\Y & 0\\Z & 0\end{Bmatrix}_A$	At point A		
Planar of normal $\vec{x}$	3	3	$\begin{Bmatrix}\omega_x & 0\\0 & v_y\\0 & v_z\end{Bmatrix}_A$	$\begin{Bmatrix}X & 0\\0 & M\\0 & N\end{Bmatrix}_A$	Everywhere		
Spherical groove of center A and axis $(A,\vec{x})$	2	4	$\begin{Bmatrix}\omega_x & v_x\\\omega_y & 0\\\omega_z & 0\end{Bmatrix}_A$	$\begin{Bmatrix}0 & 0\\Y & 0\\Z & 0\end{Bmatrix}_A$	At point A		
Cylinder-plane joint of contact line $(A,\vec{x})$ and normal $\vec{y}$	2	4	$\begin{Bmatrix}\omega_x & v_x\\\omega_y & 0\\0 & v_z\end{Bmatrix}_A$	$\begin{Bmatrix}0 & 0\\Y & 0\\0 & N\end{Bmatrix}_A$	On the plane $(A,\vec{x},\vec{y})$		
Point-plane of normal $(A,\vec{x})$	1	5	$\begin{Bmatrix}\omega_x & 0\\\omega_y & v_y\\\omega_z & v_z\end{Bmatrix}_A$	$\begin{Bmatrix}X & 0\\0 & 0\\0 & 0\end{Bmatrix}_A$	On the normal line $(A,\vec{x})$		
« Spherical joint with an ergot » no true equivalent to this joint in english center A and axis $\vec{x}$	4	2	$\begin{Bmatrix}0 & 0\\\omega_y & 0\\\omega_z & 0\end{Bmatrix}_A$	$\begin{Bmatrix}X & L\\Y & 0\\Z & 0\end{Bmatrix}_A$	At point A		

Degree of constraint

Degree of freedom