

## SYMBOLES DE GENIE CHIMIQUE

### BACCALAUREAT

*Chimie de laboratoire et de procédés industriels*




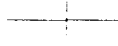

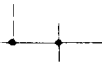
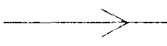
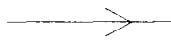

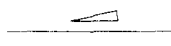
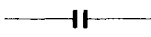
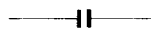



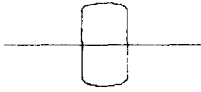
### BREVET DE TECHNICIEN SUPERIEUR

*Chimiste*

#### Classification des appareils

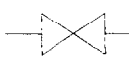
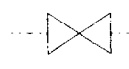
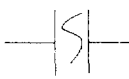
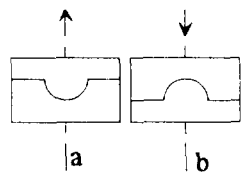
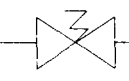
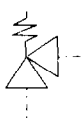

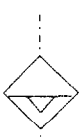
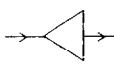
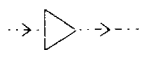
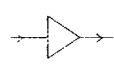
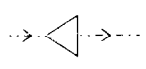
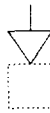

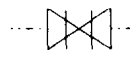
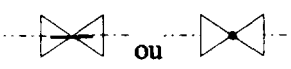
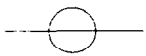
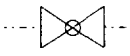



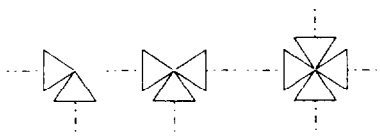
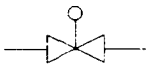
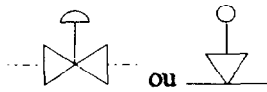

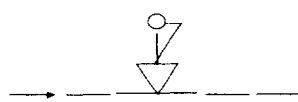
| Repère | Type                   | Appareils   |   |
|--------|------------------------|---|---|
| A      | AGITATEUR              | Agitateurs de tous types pour homogénéiser des phases liquides                |   |
| B      | BROYEUR                | Concasseurs<br>Broyeurs<br>Pulvérisateurs                                     |   |
| C      | COMPRESSEUR            | Compresseurs<br>Ventilateurs<br>Pompes à vide ...                             |   |
| D      | COLONNE<br>TOUR        | Colonnes et tours<br>- Rectification<br>- Extraction                          | - Lavage<br>- Absorption                                |
| E      | ÉCHANGEUR              | - Bouilleurs<br>- Évaporateurs<br>- Économiseurs<br>- Surchauffeurs ...       | - Réfrigérant<br>- Condenseurs<br>- Aéroréfrigérant ... |
| F      | FOUR                   | Fours de fusion, grillage, cuisson<br>Hauts fourneaux<br>Sécheur              |   |
| M      | MÉLANGEUR              | Agitateurs de tous types pour homogénéiser des phases semi-fluides et solides |   |
| P      | POMPE                  | Pompe de tous types   |   |
| R      | RÉSERVOIR<br>RÉCIPIENT | Bac<br>Réservoirs<br>Ballons  | Gazomètres<br>Silos<br>Trémies ...                      |
| S      | SÉPARATEUR<br>FILTRE   | Crible<br>Décanteurs<br>Filtres   | Essoreuses<br>Dépoussiériers<br>Centrifugeuses ...      |
| T      | TRANSPORTEUR           | Transporteurs<br>Convoyeurs<br>Élévateurs                                     | Portiques<br>Grues ...                                  |
| V      | CHAUDIÈRE À VAPEUR     | Chaudières à vapeur<br>Chaudières à fluide caloporteur<br>Fours tubulaires    |   |

## Tuyauteries







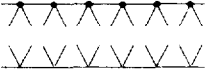
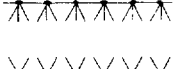
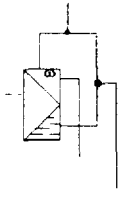
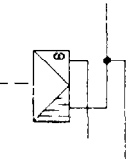
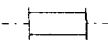
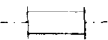



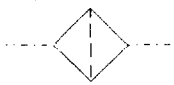


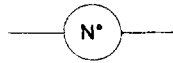








| Nom  | Norme 1976  | Norme 1995   |
|--|---|--|
| Tuyauteries de tous types                            |  |   |
| Croisement de tuyauteries<br>(sans raccordement)     |  |   |
| Croisement de tuyauteries<br>(avec raccordement)     |  |   |
| Sens d'écoulement                                    |  |   |
| Pente de tuyauterie                                  |  |   |
| Assemblage par bride                                 |  |   |
| Entrée de tuyauterie (a)<br>Sortie de tuyauterie (b) |   |   |
| Tuyauterie flexible                                  |  |   |
| Isolation thermique                                  |   |  |

|                      |    |    |
|----------------------|----|----|
| Air                  | A  | A  |
| Eau                  | E  | E  |
| - de refroidissement | ER | ER |
| - de lavage          | EL | EL |
| - condensée          | EC | EC |
| - déminéralisée      | ED | ED |
| Vapeur               | V  | V  |
| - surchauffée        | VS | VS |
| Gaz                  | G  | G  |
| Diazote              | GN | GN |
| Dihydrogène          | GH | GH |
| Dioxygène            | GO | GO |
| Fluide thermique     | FT | FT |
| Fluide frigorigène   | FF | FF |
| Fluide réfrigérant   | FR | FR |
| Saumure              | SA | SA |

## Robinetterie












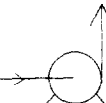
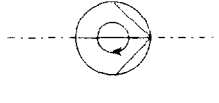


| Nom  | Norme 1976   | Norme 1995  |
|--|--|---|
| Robinet (symbole général)                                  |   |    |
| Disque de rupture<br>(a) à surpression<br>(b) à dépression |   |    |
| Soupape de sûreté  |   |    |
| Purgeur  |   |    |
| Clapet de non retour                                       |   |  |
| Clapet d'arrêt   |   |  |
| Clapet de pied de crépine                                  |   |  |
| Robinet vanne  |  |  |
| Robinet à soupape  |  |  |
| Robinet à tournant droit                                   |   |  |
| Robinet à papillon   |  |  |
| Robinet d'équerre ou d'angle<br>(2, 3 ou 4 orifices)       | <br> |  |
| Robinet de régulation                                      |   |  |
| Régulateur autonome<br>détendeur                           |   |  |

## Accessoires





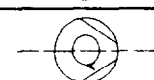
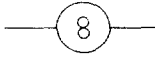





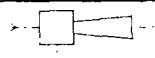
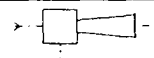
| Nom   | Norme 1976  | Norme 1995  |
|---|---|---|
| Evacuation                                    |    |    |
| Respiration                                   |    |    |
| Pulverisation par buse                        |    |    |
| Pulverisation par rampe herse et nochière     |    |    |
| Florentin<br>Séparateur avec florentin ouvert |   |    |
| Florentin<br>Séparateur avec florentin fermé  |   |   |
| Regard d'écoulement                           |  |  |
| Arrête flamme                                 |  |  |
| Filtre (sur canalisation)                     |  |  |
| Adsorbeur ou Absorbeur                        |  |  |
| Accessoire divers                             |  |  |
| Piège à vide                                  |  |  |
| Garde hydraulique                             |   |  |
| Dispositif anti bélier                        |   |  |
| Mise à la terre                               |   |  |
| Siphon  |  |  |

# Manutention des fluides

## Liquides

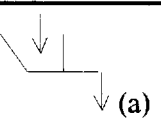
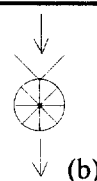
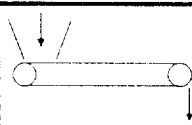
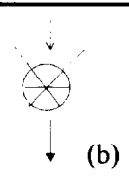
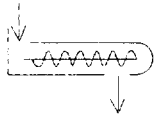
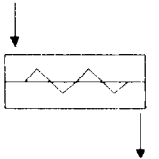
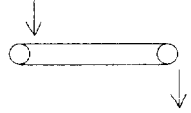

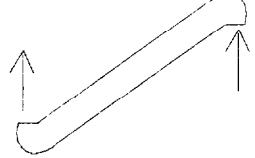

| Noms   | Norme 1976   | Norme 1995   |
|--|--|--|
| Pompe<br>Symbole général                     |   |   |
| Pompe Volumétrique                           |  |   |
| Pompe Volumétrique<br>à engrenages           |   |   |
| Pompe Volumétrique<br>alternative à piston   |   |   |
| Pompe Volumétrique<br>alternative à membrane |   |   |
| Volumétrique<br>à palette                    |  |   |
| Pompe Rotodynamique                          |  |   |
| Pompe centrifuge                             |   |   |
| Pompe doseuse                                |  |  |

## Gaz


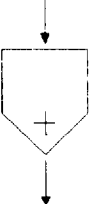
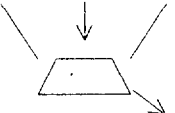
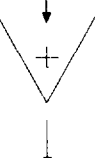
|  |   |   |
|--|---|---|
| Compresseur volumétrique                       |   |  |
| Compresseur volumétrique à<br>palettes         |   |  |
| Compresseur volumétrique à<br>piston           |   |  |
| Compresseur volumétrique à<br>membrane         |   |  |
| Centrifuge                                     |   |  |
| Ventilateur                                    |  |  |
| Pompe à vide<br>(en général)<br>à palettes     |  |  |
| A anneau liquide                               |   |  |
| Ejecteur pour le vide<br>(à eau)               |   |  |
| Appareil à jet (général)<br>injecteur éjecteur |  |  |

# Manutention des solides

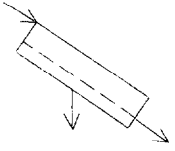
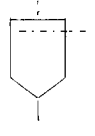
## Distribution et transport

| Noms                                      | Norme 1976  | Norme 1995  |
|---|---|---|
| Distributeur<br>(a) à bande<br>(b) écluse |  (a)  (b) |  (a)  (b) |
| Transporteur à hélice                     |    |    |
| Transporteur à bande                      |    |    |
| Transporteur à godets                     |    |   |


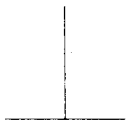

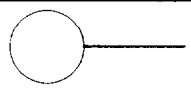
## Fragmentation

|            |   |   |
|------------|---|---|
| Broyeur    |  |  |
| Concasseur |  |  |

## Tamis



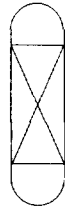
|               |   |   |
|---------------|---|---|
| Tamis à toile |  |  |
|---------------|---|---|

## Agitation

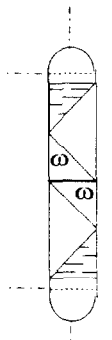
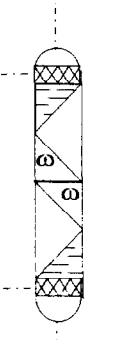
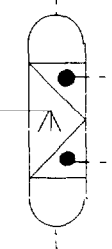
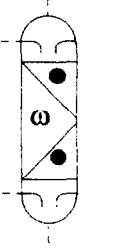
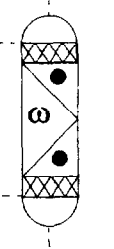
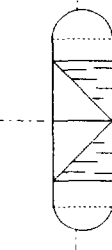
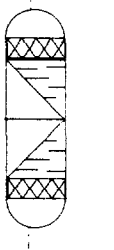
|                                       |   |   |
|---------------------------------------|---|---|
| Agitateur et mélangeurs de tous types |  |  |
| Moteur de tout type                   |  |  |

Colonnes

**Normes 1976**

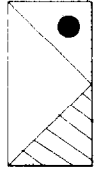
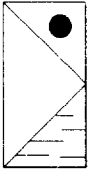
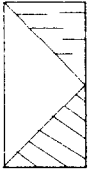
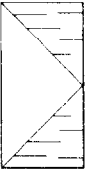
|   |   |   |
|---|---|---|
|  |  |  |
| Colonne   | Colonne à plateaux  | Colonne à garnissage  |


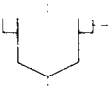



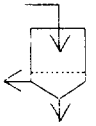
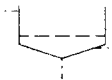
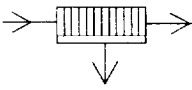
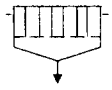
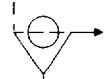
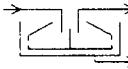


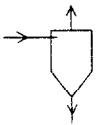
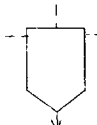
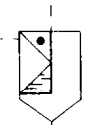
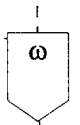
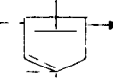
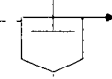
**Normes 1995**

|   |   |  |  |
|---|---|--|--|
| <p>On pourra se reporter à la page 'APPAREILS de SEPARATION' pour retrouver les symboles généraux</p> |   |  |  |
|                     |   |  |  |
| Extraction liquide /<br>liquide<br>Plateaux perforés  | Extraction liquide /<br>liquide<br>à garnissage                                     |  |  |
|                    |  |  |  |
| Séparation gaz / gaz<br>à pulvérisation   | Séparation gaz / gaz<br>à ruissellement   | Séparation gaz / gaz<br>à garnissage   |  |
|                    |  |  |  |
| Rectification-Distillation<br>Plateaux perforés   | Rectification-Distillation<br>à garnissage  |  |  |

# Appareils de séparation

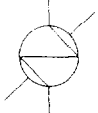
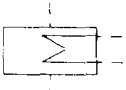
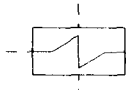
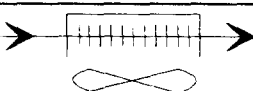

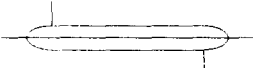
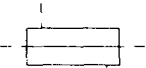


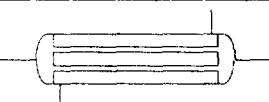

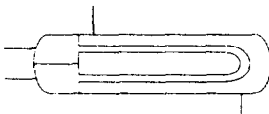
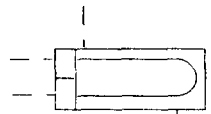
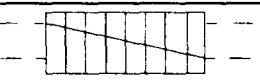
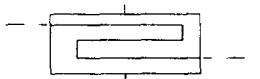
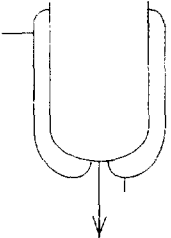
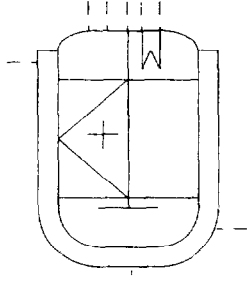
## Symbole généraux des séparations

|   |   |  |   |
|---|---|--|---|
|  |  |  |  |
| Sol / gaz   | Liq / gaz   | Sol / Liq  | Liq / Liq   |

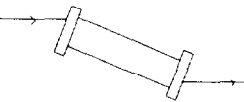
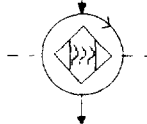
| Noms  | Norme 1976   | Norme 1995   |  |
|---|--|--|--|
| Décantation   |         |         |  |
| Filtration (général)                                |         |         |  |
| à cuve ouverte                                      |  |         |  |
| à depression (buchner)                              |        |        |  |
| Filtre-pressé                                       |       |       |  |
| Filtre à tambour                                    |  |       |  |
| Essoreuse   |       |       |  |
| Centrifugeuse                                       |  |       |  |
| Cyclone (a)<br>Cyclone liquide gaz (b)              | <br>a | <br>a | <br>b |
| Hydrocyclone  |  |       |  |
| Flottation pneumatique (a)<br>Flottation agitée (b) |  | <br>a | <br>b |



# Echangeurs de chaleur






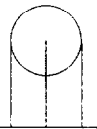
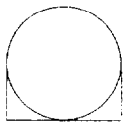

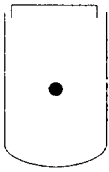



| Noms   | Norme 1976  | Norme 1995   |
|--|---|--|
| Symbole général                                      |    |  |
| Refroidisseur (a)<br>Réchauffeur (b)                 |   | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"><br/>a</div> <div style="text-align: center;"><br/>b</div> </div> |
| Tube à ailettes                                      |    |   |
| Double enveloppe (Liebig)                            |    |   |
| Tube en U (épingle)                                  |    |   |
| Faisceau tubulaire                                   |    |   |
| Faisceau à tubes en U                                |   |    |
| Echangeur à plaques                                  |   |   |
| Serpentin  |   |   |
| Séchoir tournant                                     |   |  |
| Cuve à double enveloppe<br>Réacteur de type Grignard |  |   |

## Chauffage

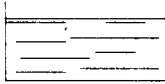
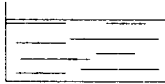
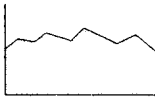
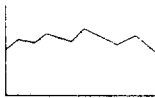
| Noms             | Norme 1976  | Norme 1995  |
|------------------|---|---|
| Séchoir Tournant |  |  |

Réservoirs et produits

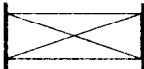

**Réservoirs**

| Noms          | Norme 1976  | Norme 1995  |
|---------------|---|---|
| Ouvert        |    |    |
| Fermé         |    |    |
| Sous pression |    |   |
| Sphérique     |    |    |
| Gazomètre     |   |   |
| Silo          |   |  |

**Produits**

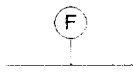

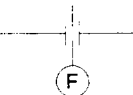
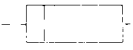


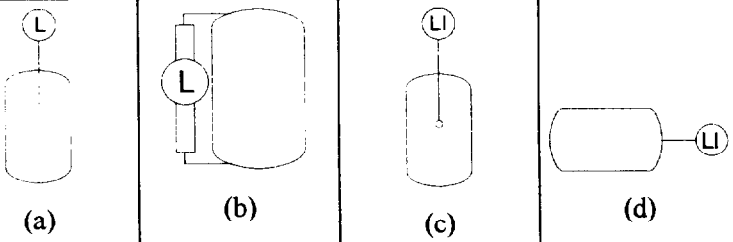
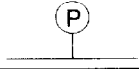

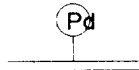
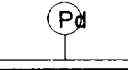


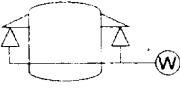
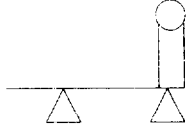
|                 |   |   |
|-----------------|---|---|
| Produit liquide |  |  |
| Produit solide  |  |  |

**Garnissage**

|         |   |   |
|---------|---|---|
| Symbole |  |  |
|---------|---|---|

# Mesures et controle

## Symbole des grandeurs mesurées : 1ère lettre

| Noms                |           | Norme 1976   | Norme 1995  |
|---------------------|-----------|--|---|
| Analyse             | <b>A</b>  |  |   |
| Débit (Flow)        | <b>F</b>  | Symbole général<br>           | <br>Compteur |
|                     |           | Diaphragme<br>                |              |
|                     |           | Rotamètre<br>                 |              |
| Densité             | <b>D</b>  |  |   |
| Niveau (Level)      | <b>L</b>  | (a) Symbole général<br>(b) Niveau en verre<br>(c) Point de mesure intérieur<br>(d) Indication locale de niveau |              |
| Pression (Pressure) | <b>P</b>  | Symbole général<br>         |            |
|                     | <b>Pd</b> | Pression différentielle<br> |            |
| Température         | <b>T</b>  | Symbole général<br>         |            |
| Masse               | <b>W</b>  | (a) peson<br>               |   |
|                     |           | (b) bascule<br>            |   |

### Autres Grandeurs



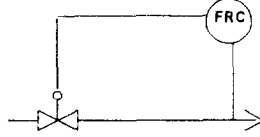
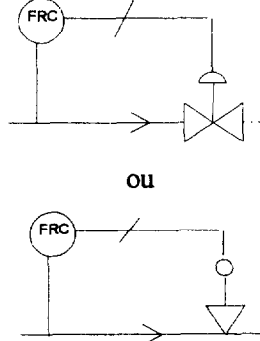
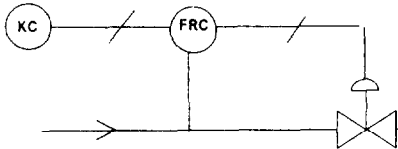
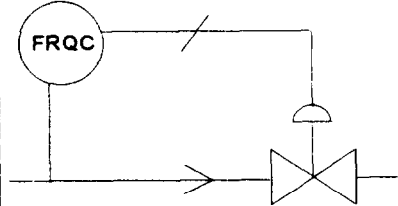
|              |          |           |          |         |           |
|--------------|----------|-----------|----------|---------|-----------|
| Conductivité | <b>C</b> | Viscosité | <b>N</b> | pH      | <b>PH</b> |
| Temps        | <b>K</b> | Humidité  | <b>M</b> | Analyse | <b>A</b>  |

### Autres lettres

#### Seconde lettre

|                  |          |                      |          |        |          |
|------------------|----------|----------------------|----------|--------|----------|
| Grandeur lue     | <b>I</b> | Grandeur Enregistrée | <b>R</b> | Alarme | <b>A</b> |
| Totalisation     | <b>Q</b> |                      |          |        |          |
| Grandeur régulée | <b>C</b> |                      |          |        |          |

# Régulation

| Nom                                  | Norme 1976  | Norme 1995  |
|--------------------------------------|---|---|
| Actionneur                           |  | <br>ou |
| Débit régulé                         |  | <br>ou |
| Débit régulé pendant un temps donné  |   |        |
| Débit enregistré, totalisé et régulé |   |       |