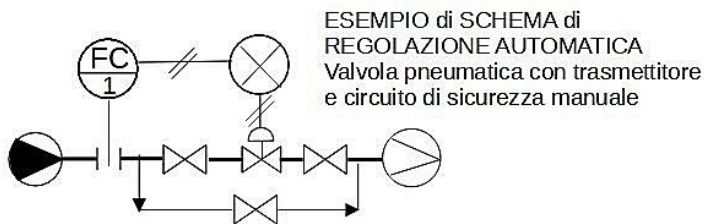
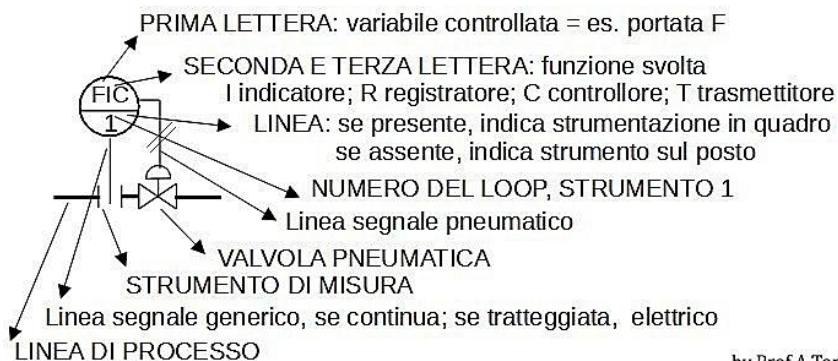


# LABORATORIO TECNOLOGIE CHIMICHE 4 ITI CHIMICA - SCHEMI DI DISEGNO

ottenuti con "libreoffice draw" - a cura del Prof.A.Tonini – [www.andytonini.com](http://www.andytonini.com)  
 [=> i disegni come files .jpg sono presenti nel CD 4CHIMICA ITI da ottobre '22]



## SIMBOLOGIA DI STRUMENTAZIONE DI CONTROLLO AUTOMATICO:



by Prof.A.Tonini

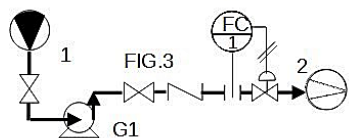
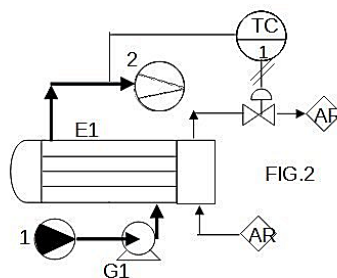
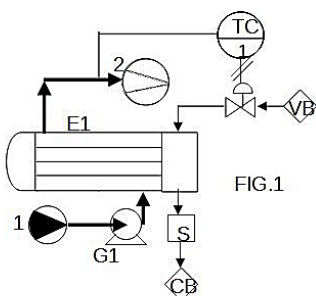
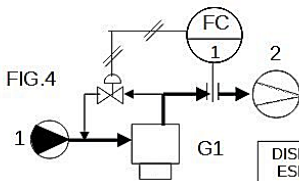
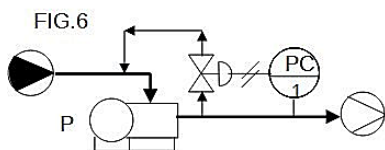
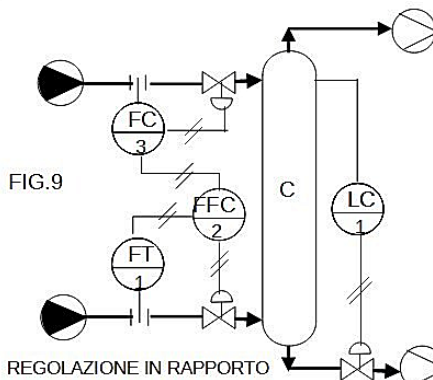
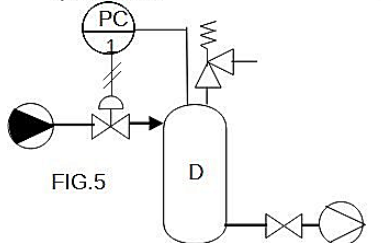


FIG.5

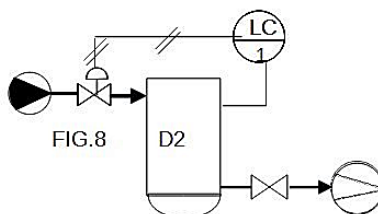
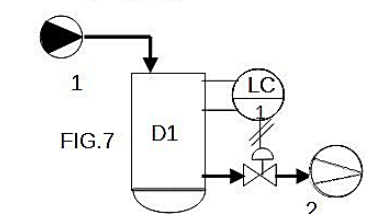


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DISEGNO DI SCHEMI DI CONTROLLO AUTOMATICO  
 ESEMPI TC / FC / LC / PC / E IN RAPPORTO

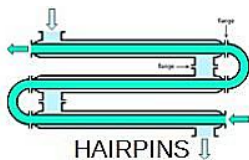


REGOLAZIONE IN RAPPORTO



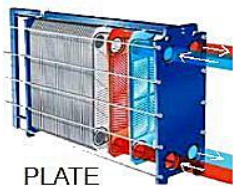
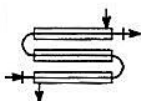
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APPARECCHIATURE DI SCAMBIO TERMICO - 1



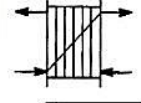
HAIRPINS

FIG. 1



PLATE

FIG. 2



AIR

FIG. 3

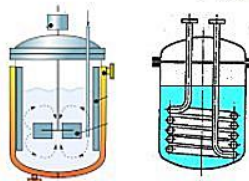
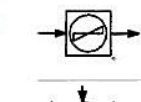
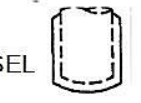
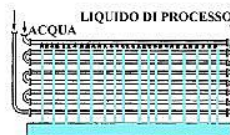


FIG. 4/5

FIG. 4

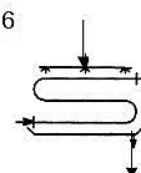


VESEL



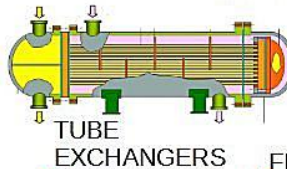
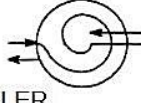
RAIN COOLER

FIG. 6



SPIRAL COOLER

FIG. 7



TUBE EXCHANGERS

FIG. 8

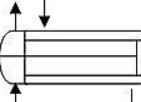
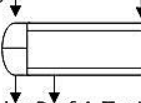


FIG. 9



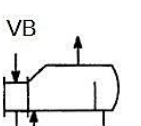
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APPARECCHIATURE DI SCAMBIO TERMICO - 2



KETTLE BOILER

FIG. 10



CONDENSERS

FIG. 11

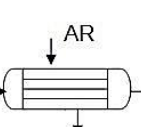
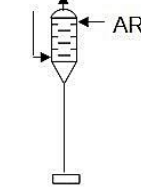


FIG. 12



COOLING TOWER

FIG. 13

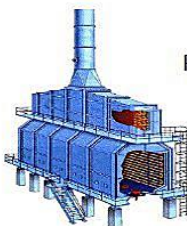
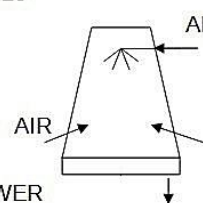
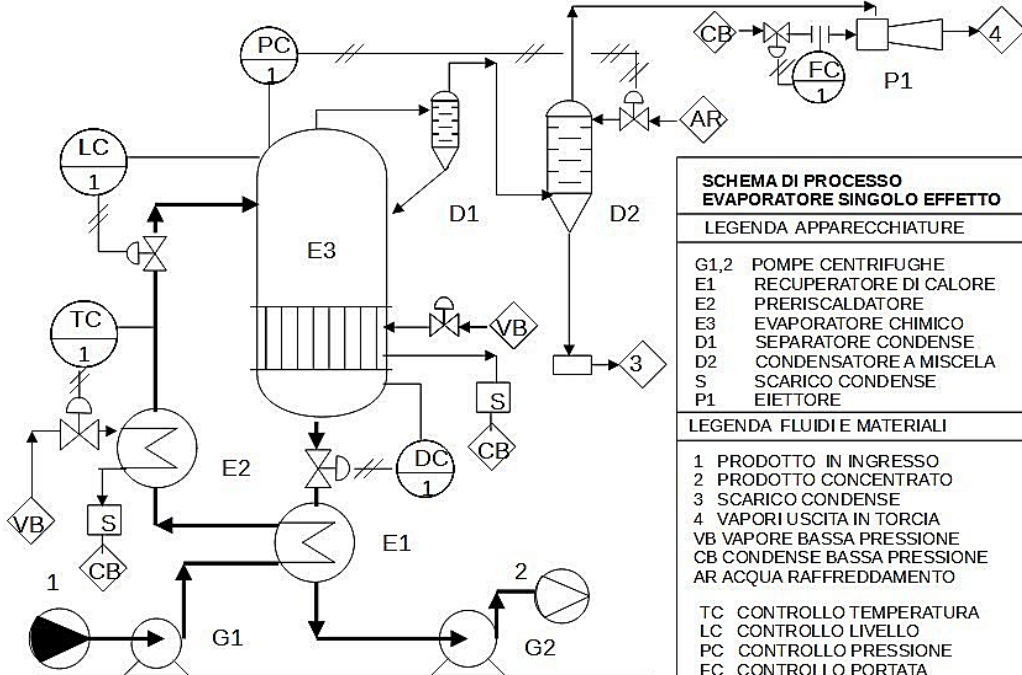


FIG. 14

INDUSTRIAL BURNERS

=> DA FARE:  
DESCRIZIONI E APPLICAZIONI  
SIMBOLI UNICHIM

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SCHEMA DI PROCESSO  
EVAPORATORE SINGOLO EFFETTO

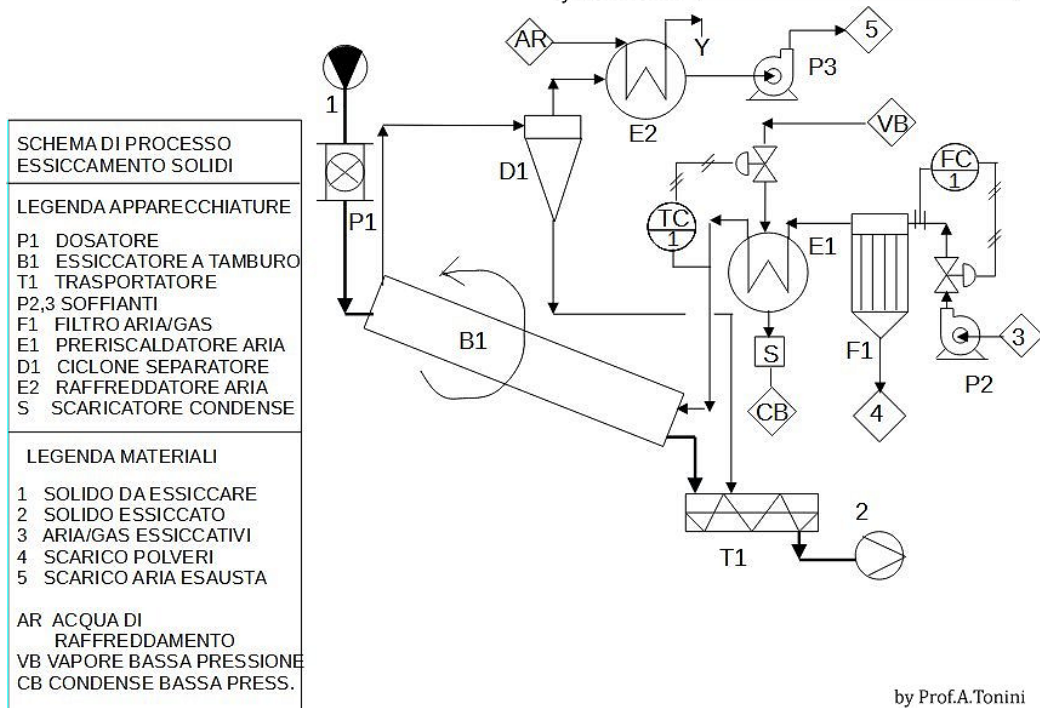
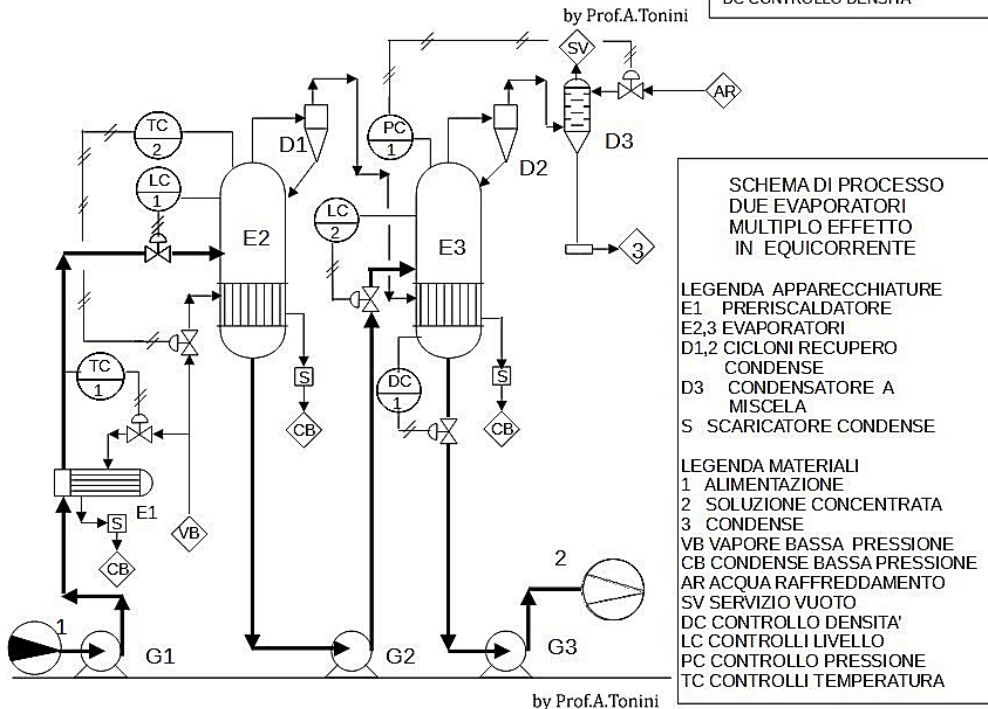
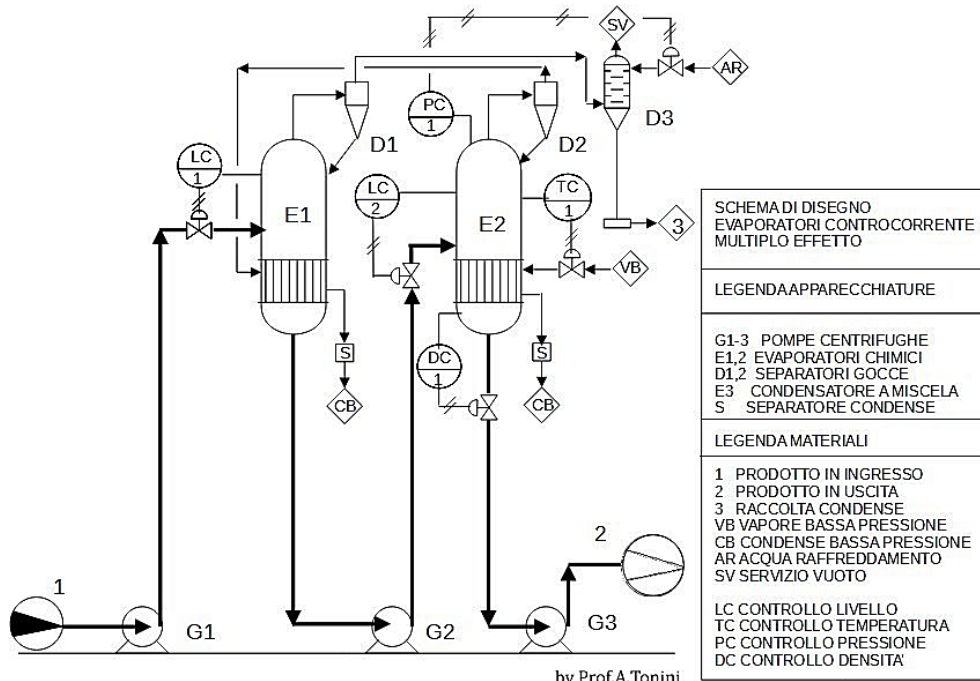
LEGENDA APPARECCHIATURE

- G1,2 POMPE CENTRIFUGHE
- E1 RECUPERATORE DI CALORE
- E2 PRERISCALDATORE
- E3 EVAPORATORE CHIMICO
- D1 SEPARATORE CONDENSE
- D2 CONDENSATORE A MISCELA
- S SCARICO CONDENSE
- P1 EIETTORE

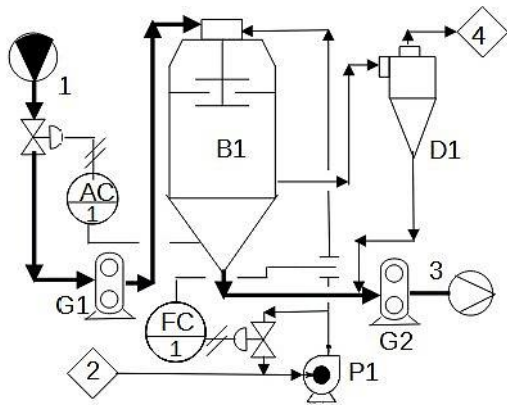
LEGENDA FLUIDI E MATERIALI

- 1 PRODOTTO IN INGRESSO
- 2 PRODOTTO CONCENTRATO
- 3 SCARICO CONDENSE
- 4 VAPORI USCITA IN TORCIA
- VB VAPORE BASSA PRESSIONE
- CB CONDENSE BASSA PRESSIONE
- AR ACQUA RAFFREDDAMENTO
- TC CONTROLLO TEMPERATURA
- LC CONTROLLO LIVELLO
- PC CONTROLLO PRESSIONE
- FC CONTROLLO PORTATA
- DC CONTROLLO DENSITA'

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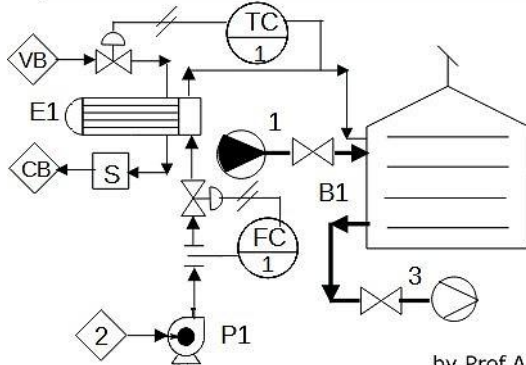




SCHEMA DI PROCESSO ESSICCATORE SPRAY ROTATIVO

LEGENDA APPARECCHIATURE  
 G1,2 POMPE ROTATIVE  
 P1 SOFFIANTE  
 B1 ESSICCATORE SPRAY  
 D1 CICLONE SEPARATORE

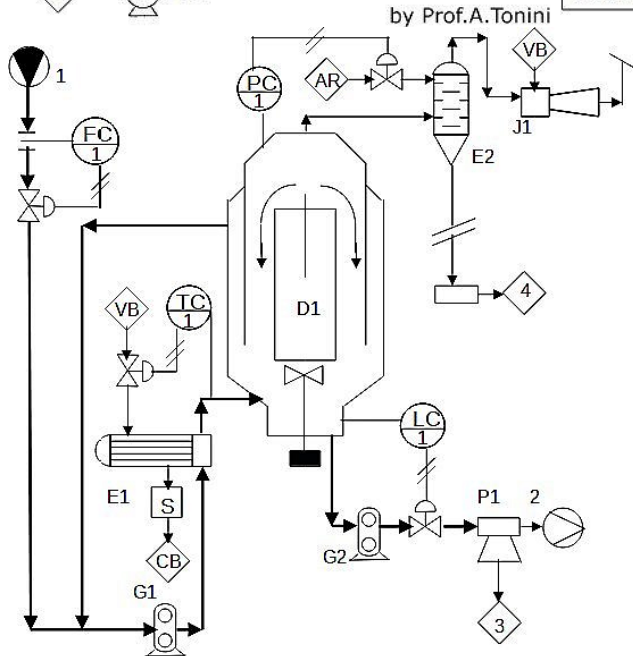
LEGENDA MATERIALI  
 1 SOLIDO IN INGRESSO  
 2 ARIA CALDA ESSICCATIVA  
 3 SOLIDO ESSICCATO  
 4 USCITA GAS ESAUSTI



SCHEMA DI PROCESSO ESSICCATORE AD ARMADIO

LEGENDA APPARECCHIATURE  
 P1 SOFFIANTE  
 E1 PRERISCALDATORE  
 B1 ESSICCATORE AD ARMADIO  
 S SCARICO CONDENSE

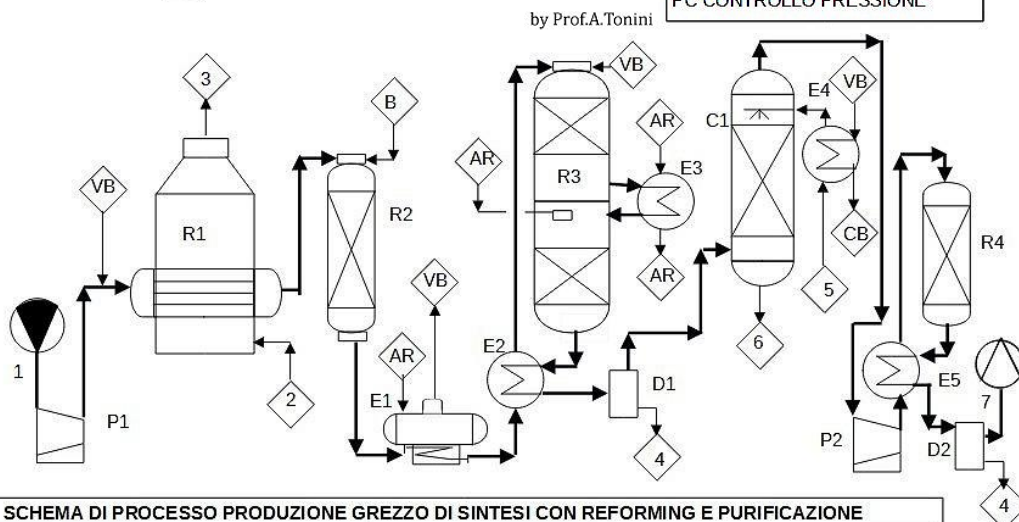
LEGENDA MATERIALI  
 1 MATERIALE SOLIDO IN INGRESSO  
 2 ARIA ESSICCANTE  
 3 MATERIALE SOLIDO IN USCITA  
 VB VAPORE BASSA PRESSIONE  
 CB CONDENSE BASSA PRESSIONE



SCHEMA DI PROCESSO CRISTALLIZZATORE A TURBOLENZA PER EVAPORAZIONE DTB

LEGENDA APPARECCHIATURE  
 E1 RISCALDATORE  
 G1,2 POMPE ROTATIVE  
 D1 CRISTALLIZZATORE  
 P1 CENTRIFUGA  
 E2 CONDENSATORE A MISCELA  
 J1 EIETTORE  
 S SCARICO CONDENSE

LEGENDA MATERIALI  
 1 ALIMENTAZIONE  
 2 CRISTALLI  
 3 SOLUZIONE SATURA  
 4 CONDENSE  
 VB VAPORE BASSA PRESSIONE  
 CB CONDENSE BASSA PRESSIONE  
 AR ACQUA DI RAFFREDDAMENTO  
 TC CONTROLLO TEMPERATURA  
 FC CONTROLLO PORTATA  
 LC CONTROLLO LIVELLO  
 PC CONTROLLO PRESSIONE

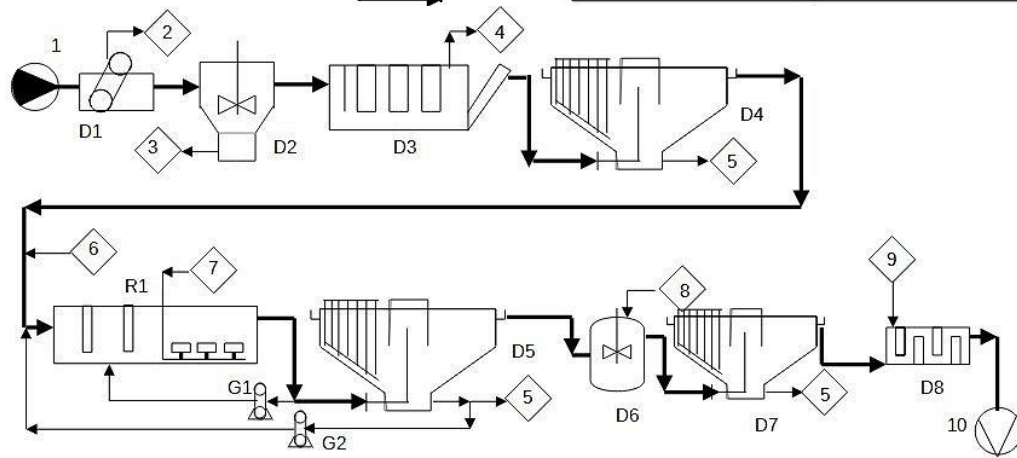
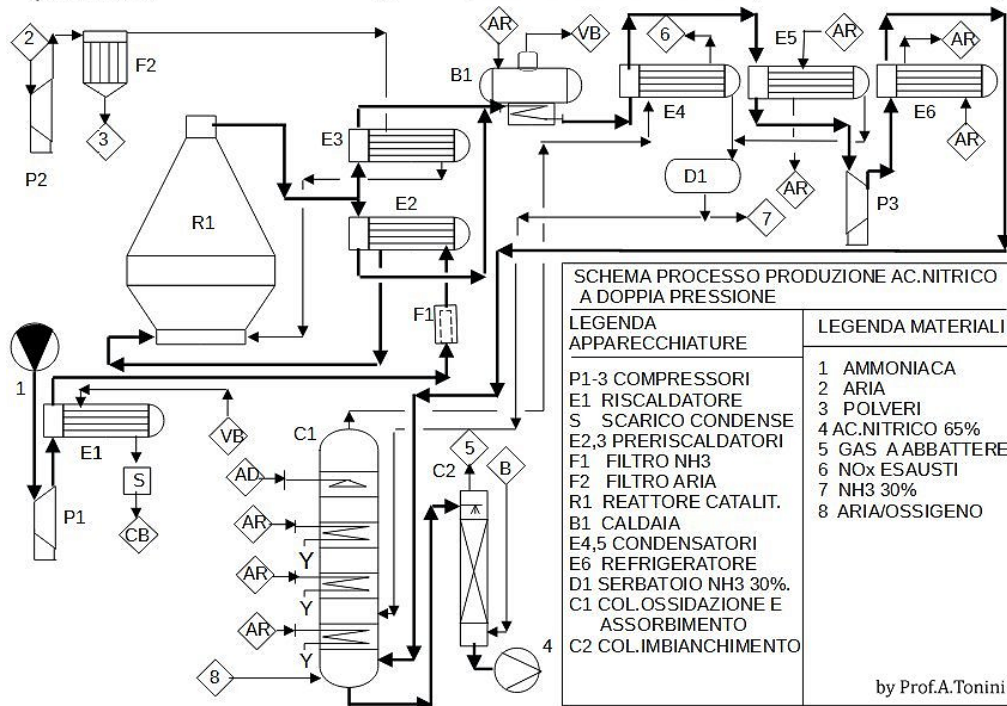
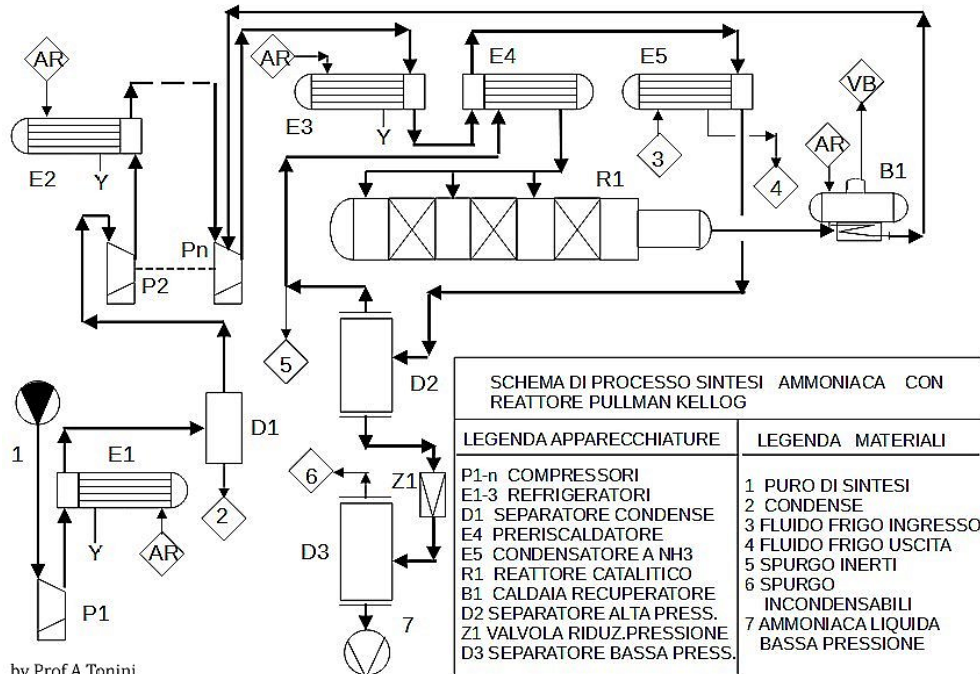


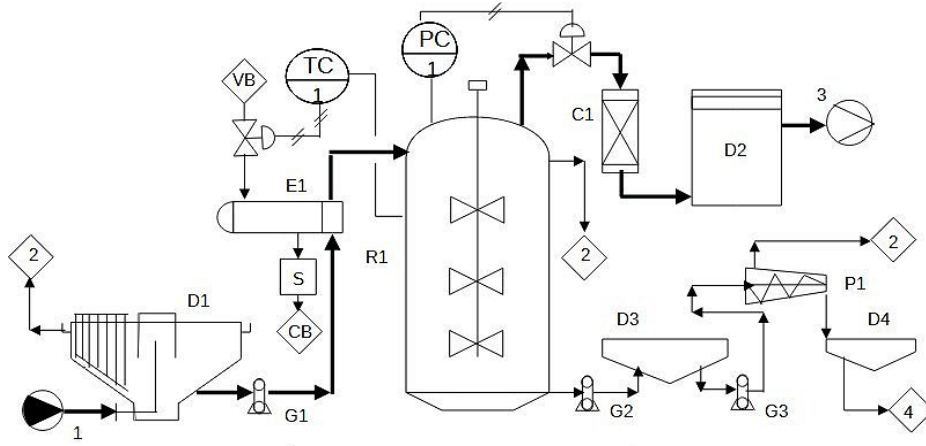
SCHEMA DI PROCESSO PRODUZIONE GREZZO DI SINTESI CON REFORMING E PURIFICAZIONE

LEGENDA APPARECCHIATURE  
 P1,2 COMPRESSORI CENTRIFUGHI  
 R1-4 REATTORI CATALITICI  
 E1 CALDAIA RECUPERO EN.  
 E2,5 SCAMBIATORI RECUPERATORI  
 E3 SCAMBIATORE RAFFREDDATORE  
 E4 SCAMBIATORE RISCALDATORE  
 C1 COLONNA ASSORBIMENTO  
 D1,2 SEPARATORI CONDENSE

LEGENDA MATERIALI  
 1 GAS NATURALE  
 2 GAS COMBUSTIBILE  
 3 SCARICO FUMI  
 4 CONDENSE  
 5 SOLUZIONE ALCALINA  
 6 SCARICO SOLUZIONE  
 7 GAS PURO DI SINTESI  
 AR ACQUA RAFFREDDAMENTO  
 VB VAPORE BASSA PRESSIONE  
 CB CONDENSE BASSA P.

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LEGENDA APPARECCHIATURE

D1 ISPESITTORE  
 E1 PRERISCALDATORE  
 R1 DIGESTORE ANAEROBICO  
 C1 FILTRO BIOGAS  
 D2 SERBATOIO BIOGAS  
 D3 ACCUMULATORE FANGHI  
 P1 CENTRIFUGA FANGHI  
 D4 SERBATOIO RACCOLTA

S SEPARATORE CONDENSE

LEGENDA MATERIALI

1 FANGHI IN INGRESSO  
 2 ACQUE DA DEPURARE  
 3 BIOGAS  
 4 FANGHI A SMALTIMENTO  
 VB VAPORE BASSA PRESSIONE  
 CB CONDENSE BASSA PRESSIONE

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