

# QUESTIONNAIRE

## Vinyl Chloride Safety Association Survey - 1985

### P.V.C. Reactor Rupture Discs

Questions have recently been raised concerning the safe use of rupture discs under safety valves and the safe use of reverse buckling rupture discs on P.V.C. reactors. The bases for these concerns are centered on pressure build-up above the disc and on increased burst pressure if disc inversion occurs without failure. A review of present practices in the P.V.C. industry may be enlightening to update experiences with rupture discs in service on P.V.C. reactors. If your plant has two or more reactor sizes, please respond separately for each size.

#### Set Pressure Considerations:

- |                                                                                                      |                      |
|------------------------------------------------------------------------------------------------------|----------------------|
| 1. Reactor size (USG)                                                                                | <u>14,000</u> gal    |
| 2. Vessel pressure rating of reactors (psig)                                                         | <u>232</u> PSIG      |
| 3. Rupture disc size (in. diameter)                                                                  | <u>4</u> inch        |
| 4. Is the disc in series with a safety valve? (Y/N)                                                  | <u>no</u>            |
| 5. Set pressure at i) 72°F is                                                                        | <u>        </u> psig |
| ii) burst temperature of <u>180</u> °F is                                                            | <u>225</u> psig      |
| 6. Manufacturing range of disc - % over specified                                                    | <u>        </u>      |
| - % under specified                                                                                  | <u>        </u>      |
| Is this range available from the manufacturer only upon special request? (Y/N)                       | <u>        </u>      |
| 7. Burst Tolerance of disc (%)                                                                       | <u>        </u>      |
| Is this tolerance available from the manufacturer only upon special request? (Y/N)                   | <u>        </u>      |
| 8. What reduction in the safety valve relief capacity is assumed if a disc is situated below it? (%) | <u>N/A</u>           |
| 9. Safety valve setting (psig)                                                                       | <u>N/A</u>           |

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Rupture Disc Manufacture And Installation:

1. Rupture disc type (eg. Scored reverse buckling, prescored and bulged) Reverse Buckling
2. Manufacturer and Model No. BS&B model# RB-90-11
3. Number of discs at each location 2 x 2
4. Disc material Nickel
5. Do you specify J-bolts on the discs to prevent improper installation? (Y/N) nc  
If not, what methods are used to ensure proper disc orientation? \_\_\_\_\_  
Are torque requirements applied during disc installation? (Y/N) yes
6. Are there any styles of discs that you would not consider installing? (material or type) \_\_\_\_\_  
Please relate any reasons or experiences that cause you to exclude these styles.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
7. If the disc is located below a safety valve or if two discs are utilized in series:
  - i) How are rupture disc leaks detected? Century Access Flow Check
  - ii) How is the space between safety devices vented? \_\_\_\_\_
  - iii) Where does this system vent to (e.g. recovery system)? \_\_\_\_\_
  - (iv) If venting is manual, how often is the pressure monitored? \_\_\_\_\_
  - (v) How frequently are discs replaced due to leakage? Very Seldom
  - (vi) How often have you found pin-hole type leaks in discs which would allow disc back-up pressure, but delay the safety valve release? Very seldom-discs are protected by polyethylene

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8. What measures are taken to prevent PVC build-up on the underside of discs? No special methods are taken, but the undersides are inspected.
9. At what frequency (# of reactor cycles) are the rupture discs inspected? Annually  
What type of inspection is performed?  
After about 800 hundred batches
- At what frequency are discs replaced? Randomly each year

General Considerations:

1. What are your concerns (if any) with your present rupture discs?  
No present concerns with rupture discs
2. Have you ever had a premature rupture disc failure (Y/N) No  
If so: A. How many (approximately) in 1984: 0-5 0  
5-20   
20
- B. Most frequent causes for failures:  
i) We have had no recent rupture disks failures on reactors  
ii)   
iii)

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3. Have you ever had a rupture disc not burst at the set pressure (Y/N)?

If so, how large an overpressure occurred? (psig)

Time since last occurrence (years)

Most frequent causes of this occurrence:

1. Not within the last several years.

2. \_\_\_\_\_

3. \_\_\_\_\_

4. What experiences have you had with rupture discs that might be helpful for other PVC manufacturers to know of?

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Please send replies by August 1, 1985 to:

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