

# Syndiotactic 1, 2- Polybutadiene (RB)

- RB contains over 90% of 1,2 bonds.
- The average molecular weight is about 120,00.
- It is a unique Thermoplastic Elastomer of which the crystallinity is controlled so that it comes within about 15% and 30%.

## Why RB-820 Over TAIC?

RB-820 is a versatile 1,2-polybutadiene based co-agent that acts as an efficient promoter in peroxide curing systems, improving cure density, mechanical strength, and processability in rubber compounds. It can effectively replace conventional co-agents such as TAC or TAIC while delivering superior performance.

## Unique Features of RB-820 as a Co-Agent?

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1. **Replaces Conventional Co-Agents:** It can substitute traditional peroxide co-agents like TAC, TAIC, Liquid PBD, TMPTMA, EDMA, and BDMA, simplifying formulations.
2. **Co-vulcanizing & Non-Extractable** – RB-820 chemically reacts during curing and becomes part of the rubber network, so it does not migrate or get extracted by oils or solvents.
3. **Improves Cure Density (Tight Cure)** – RB-820 promotes efficient cross-linking in peroxide systems, resulting in tighter and more uniform vulcanization.
4. **Enhances Mechanical Properties** – It improves tensile strength, hardness, and overall physical performance of rubber compounds.
5. **Better Compression Set** – Compounds containing RB-820 generally show reduced compression set, improving sealing performance in rubber parts.
6. **Compatible with Multiple Polymers** – Works effectively with NBR, EPDM, CR, NR, Butyl, HNBR, and other rubber systems.
7. **Ash-Free Contribution with Easy Handling:** RB is an organic polymer and does not contribute to ash formation in the final product, making it suitable for applications requiring critical property control. Additionally, being available in pellet form, RB offers easier and safer handling compared to liquid co-agents such as TAIC, improving operational efficiency.

RB-820 acts as a reactive **Polymeric Co-Agent + Processing Aid**, improving cure efficiency, mechanical properties, and processability simultaneously.

## Typical Formulations with Results:

| RB-820 in EPDM                                |        |        |
|---|--------|--------|
|   | A      | B      |
| JSR EP-24                                     | 100.00 | 100.00 |
| RB-820  | --     | 10.00  |
| Black FEF                                     | 50.00  | 50.00  |
| IPOL 2300                                     | 5.00   | 5.00   |
| ZnO   | 3.00   | 3.00   |
| Stearic Acid                                  | 0.50   | 0.50   |
| Perkadox 14/40                                | 4.00   | 4.00   |
| TAC   | 2.00   | --     |
| Cure Time 12' at 180°C                        |        |        |
| Shore A Hardness                              | 70.00  | 71.00  |
| Tensile Strength (Kg/cm <sup>2</sup> )        | 160.00 | 181.00 |
| % Elongation                                  | 180.00 | 190.00 |
| Compression Set Method B<br>22 Hours at 150°C | 12%    | 11%    |

| RB-820 in HNBR                                |        |        |
|---|--------|--------|
|   | A      | B      |
| HNBR Therban 1707                             | 100.00 | 100.00 |
| RB-820  | --     | 10.00  |
| Black FEF                                     | 50.00  | 50.00  |
| MgO   | 10.00  | 10.00  |
| ZnO   | 2.00   | 2.00   |
| Stearic Acid                                  | 0.50   | 0.50   |
| Perkadox 14/40                                | 4.00   | 4.00   |
| TAC   | 2.00   | --     |
| Cure Time 10' at 180°C                        |        |        |
| Shore A Hardness                              | 67.00  | 69.00  |
| Tensile Strength (Kg/cm <sup>2</sup> )        | 204.00 | 212.00 |
| % Elongation                                  | 460.00 | 450.00 |
| Compression Set Method B<br>22 Hours at 150°C | 39     | 33     |

