

## **Executive Summary**

A detailed sector - wise study on R&D manpower deployed in the industry has not been carried out so far. The study "profile of R&D manpower in various industrial sectors" was awarded by NSTMIS Division of Department of Science and Technology, to AMC Research Group to fill this gap.

The study was also required to collect data from MNCs having R&D centre in India to bring out a comparative study on the profile of R&D manpower in MNCs and Indian industry R&D centre.

The data has been collected through specially designed questionnaire, desk research, email, telephone call, personal visit and fax. 1270 companies were approached, both Indian & MNCs, 573 Indian companies and 28 MNCs responded. The major outcomes of the study are as below:

### **Indian Companies:**

1. 30% of the companies have turn over of above Rs.250 crores, while 28 percent of the companies have turn over between Rs.50 crores to Rs.250 crores. Around 42% of the companies have turn over below Rs.50 crores.
2. 6150 patents were filed by the Indian companies which have responded. Out of that 1855 patents were granted. Numbers of patents filed are not enough.
3. During last five years a total of 3700 articles were published out of them, 2136 were in national journals while 1564 were in international journals.
4. 52% of R&D personnel earn less than Rs.3 lakhs while just 7% earn more than Rs.10 lakhs. Around 78% R&D personnel earn less than Rs.5 lakhs annually while 22% get more than Rs.5 lakhs per annum.
5. 19390 personnel are employed on R&D activities, 88% of them are male while 12% of them are female.
6. 64% of the R&D personnel are in the age group of 25 -40 years, while only 7% are in the age group 50 – 55 years. In age group of above 55

years a maximum 98% R&D employee are male while maximum presence of female (17%) are in the age group of 25 – 40 years.

7. Higher numbers of R&D personnel are in Drugs and Pharmaceutical industry while very few people are employed by dyestuff industry and agricultural machinery industry. About 63% R&D personnel are from a group of industries comprising of Drugs & Pharmaceuticals, Electricals & Electronics, Transportation and Chemicals industries.
8. 28 % R&D personnel are post graduate, while only 8% possesses PhDs qualification. The graduate Engineers are 19% while post graduate engineers are just 9%.
9. The maximum number of PhDs, post graduates, post graduates engineers and graduates are in Drugs and pharmaceutical industries while maximum numbers of engineering graduates are in Transportation industry. Out of total number of female employed, the percentage of female graduate is maximum (100%) in Dyestuff, and Defence industries respectively. Out of the total number of personnel employed in sugar industry, the female employee having PhD qualification is 50 percent, while the male employee having PhD qualification is 38 percent.
10. As far as projections are concerned, there would be an increase of 224 percent for PhDs in transport industries in next five years. For post graduate engineers there would be an increase of 426 percent in machine tools industry while there would be an increase of 250 percent for post graduate in timber products industry. There would be an increase of 566.7 percent for graduate engineers and 500 percent for graduates in agricultural machinery industry.

### **MNCs**

1. 43% of the companies have turnover of above Rs. 250 crores, while 21 percent of the companies have turnover between Rs.50 crores to Rs. 250 crores. Around 36% of the companies have turn over below Rs.50 crores.

2. 133 patents were filed by the MNCs which have responded. Out of that 59 patents were granted.
3. 63 technical papers were published during last five years, 47 were in national journals, while only 16 were in international journals.
4. 40% of R&D personnel have more than Rs.10 lakhs annual income. About 78 percent of the personnel earn above Rs.5 lakhs per annum and only 22% earn less than Rs.5 lakhs.
5. 837 personnel employed on R&D activities, 72 % of them are male while 28 % of them are female.
6. 71% of the R&D personnel are in the age group of 25years - 40 years while just 3% are from the age group above 55 years. About 89 percent of R&D personnel are below 50 years of age. In age group of above 55 years the percentage of male R&D employee is 100. In case of female employee the highest percentage (32) is in the age group 25 – 40 years.
7. The higher numbers of R&D personnel are in Drugs and Pharmaceutical industry while the second highest is in chemical (other than fertilizers) industry. About 74 percent R&D personnel are from industry group of drugs & pharmaceuticals and chemicals (Other than fertilizers).
8. The maximum number of PhDs, post graduates, and graduates are in Drugs and pharmaceutical industry while maximum numbers of post graduate engineers are in chemicals (other than fertilizers) industry. The female possessing PhDs qualifications are mainly employed in drugs and pharmaceutical industry. Maximum numbers of females are employed in soaps, cosmetics, toilet preparations industry. In a large number of industries, there are only male having PhD qualification. The same percentage is also observed in case of post graduate, graduate engineer and graduate qualification.
9. As far as projection is concerned there would be an increase of 110 percent for PhDs in Chemicals (other than fertilizers) industry in next five years. For post graduate engineers there would be an increase of 100 percent in Bio technology industry. In case of post graduate there

would be an increase of 128 percent in Information technology industry there would be a decrease of 100 percent in Transportation industry. There would be an increase of 300 percent each for graduate engineer and for engineer in Misc. Mechanical engineering industry and industrial equipment industry respectively.

10. The percentage of female R&D employee is higher in MNC's R&D centres in comparison to In- House R&D centres.

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