

... design and prepare specifications for chemical process systems and the construction and operation of commercial-scale chemical plants, supervise industrial processing and fabrication of products undergoing physical and chemical change, and investigate the properties of metals, ceramics, polymers and other materials and assess and develop their engineering and commercial applications.

### Indicative Skill Level

Most occupations in this unit group have a level of skill commensurate with a Bachelor degree or higher qualification. In some instances relevant experience and/or on-the-job training may be required in addition to the formal qualification (ANZSCO Skill Level 1).

### Skilled Occupation Criteria

#### Long-lead time

Chemical and Materials Engineers meet the criteria for long lead time, as entry to this occupation requires a substantial training commitment.

- ▶ Employment as a Chemical or Materials Engineer generally requires the completion of a university qualification of at least four years study (full-time equivalent), such as a Bachelor of Engineering (Chemical Engineering).

#### High use

Chemical and Materials Engineers meet the criteria for high use, showing that the skills which people have acquired through education and training are being deployed for the uses intended.

- ▶ Based on advice from Universities Australia, university courses in chemicals and materials engineering have a strong degree of match with eventual employment in engineering occupations.
- ▶ Of new graduates employed as Chemical or Materials Engineers, 88% had studied in a related field, such as engineering and related technologies (*Australian Graduate Survey, 2009*).
- ▶ As professionals, Chemical and Materials Engineers are expected to have a level of skill commensurate with a Bachelor degree or higher qualification. Of those employed as Chemical and Materials Engineers, 82% were found to possess this level of skill (*ABS Survey of Education and Work, 2010*).<sup>1</sup>

#### High risk

Chemical and Materials Engineers also meet the criteria for high risk/high disruption. This indicates that the occupation is important for the effective operation of an enterprise and/or the broader economy.

- ▶ Chemical and Materials Engineers are required to be registered or licensed in some states and territories, such as Queensland.
- ▶ Chemical and Materials Engineers are important to meet government policy priorities at both the Commonwealth and state level. These include the Green Building Fund and the

<sup>1</sup> Analysis for the Skilled Occupations List (SOL) was conducted using the latest available data, including the 2010 ABS Survey of Education and Work (SEW). Percentages may therefore differ from those cited in the 'Occupation Trends' analysis (over the page), which uses alternative sources in some instances (e.g. the 2008 ABS Survey of Education and Work). Small sample sizes for some occupations may also result in fluctuations in the SEW data between 2008 and 2010. The specific data sources used for the Occupation Trends analysis can be found on the Skills Australia website: <http://www.skillsaustralia.gov.au/SOLsummarysheets.shtml>.

development of Australia's major processing industries including aluminium, steel, iron and crude oil.

## Occupation trends

### ANZSCO: 2331

### Chemical and Materials Engineers

<b>Employment level</b>	5600 Almost all workers are employed full-time (93.0%).
<b>6 digit employment (2006 Census)</b>	233111 Chemical Engineer 1592 233112 Materials Engineer 544
<b>Employment growth</b>	Over the five years to August 2010, employment increased by 26.7% (compared with growth of 12.1% for all occupations). Employment is expected to rise by 17.1% over the next five years (compared with projected growth of 9.5% for all occupations).
<b>Unemployment rate</b>	Below average (around 1.8%) compared with all occupations.
<b>Educational profile</b>	Around 90.8% have a Bachelor degree or higher qualification.
<b>Vacancies</b>	The Internet Vacancy Index (IVI) rose markedly (well above the 'all occupations' rate) over the 12 months to September 2010 to 148.0 (March 2006=100). Vacancies for all occupations increased by 19.4%.
<b>Gender</b>	Around 18.9% of workers are female (compared with 45.4% for all occupations).
<b>Labour turnover</b>	Around 5.3% of workers leave this occupation in a year compared with 13.1% for all occupations.
<b>Age profile</b>	The median age is 37.5 years and 46.6% are aged 45 years and over (compared with 38.5% for all occupations).
<b>Earnings</b>	Median full-time weekly earnings (before tax) are above average (\$1265).
<b>Graduate outcomes</b>	Graduate Careers Australia data show 98% of Bachelor degree graduates in chemical engineering seeking full-time work were working four months after graduation, 85% of whom were working as Engineering, Science and Business, Information, Marketing Professionals.
<b>Skill shortages</b>	National shortages of Chemical Engineers have been identified through DEEWR research since 2005.

### Labour market

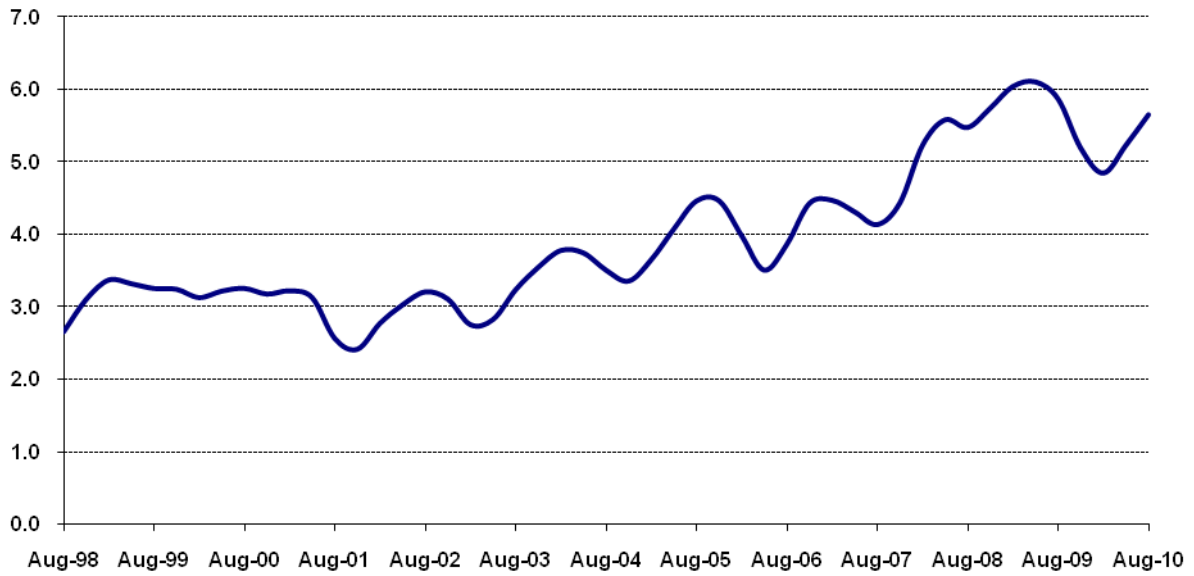
233111 Chemical Engineer: Employers have persistently experienced difficulty filling their advertised vacancies over recent years. DEEWR research in early 2010 shows an increase in both the proportion of vacancies filled and the average number of suitable applicants per vacancy compared with 2009. Employers experienced particular difficulty recruiting Chemical Engineers with specialised skill sets or high level experience. Graduate positions were more easily filled.

233112 Materials Engineer: Not assessed

### Summary

Employment growth has been strong and above average growth is expected to continue. Levels of advertised vacancies have recovered to pre-global recession levels, and shortages of Chemical Engineers have been persistent. The occupational group has a relatively old age profile suggesting there will be strong replacement demand as well as demand to fill new positions.

Chemical and Materials Engineers  
Employed Persons ('000s) Aug 1998 to Aug 2010



Internet Vacancy Index (IVI) - 3 Monthly Average - Nov 2006 - Sept 2010  
Chemical and Materials Engineers (March 2006 = 100)

