RT plc manufactures a chemical product and has operated a standard costing system to control the

material costs of the product.

The standard cost for the chemical product is:

|  |  |  |
| --- | --- | --- |
|  |  | £ |
| Direct materials A | 2 kg at £4 | 8.00 |
| Direct materials B | 4 kg at £3 | 12.00 |
| Standard material cost per unit |  | 20.00 |

The company’s annual production budget is for 60,000 units produced evenly over the year.

The first quarter shows the following results:

Production volume was 14,000 units.

|  |  |
| --- | --- |
|  | £ |
| Direct materials A - 28,500 kg | 108,300 |
| Direct materials B – 56,000 kg | 168,000 |
| Total direct material costs | 276,300 |

The management are not pleased with the actual results for the quarter. While some seem under control, others significantly differ from those set out in the standard costing system.

**Required: Prepare a full variance analysis statement of the direct material cost elements.**

**Calculation of the variances**

**Direct materials cost variances: Direct materials USAGE variance + Direct materials PRICE variance**

**For direct material A**

**Direct materials USAGE variance for A**

**= [Standard usage – Actual usage] x Standard price**

= [14,000 units x 2 kg – 28,500 kg] x £4

= [28,000 kg – 28,500 kg] x £4

= 500 kg (Adverse) x £4

= £2000 (Adverse)

**Direct materials PRICE variance for A**

**= [Standard price – Actual price] x Actual quantity used**

**= [£4 x** 28,500 - £108,300]

= [£114,000 - £108,300]

**= £5700 [Favourable]**

**Direct materials cost variances for A**

**= Standard materials cost – Actual materials cost**

= £8 per unit x 14,000 units - £108,300]

= £112,000 - £108,300

= £3,700 [F]

**Proof: Direct materials cost variance**

**= Usage variance + Price variance**

**= £2000 (Adverse) + £5700 [Favourable] = £3700 [F]**

**For direct material B**

**Direct material cost variance for B**

**= Standard materials cost – Actual materials cost**

= £12 x 14,000 units - £168,000

= £168,000 - £168,000

**= 0 or nil variance**

**Material Price variance for B**

**= [Standard price – Actual price] x Actual quantity used**

= £3 x 56,000 kg - £168,000

= £168,000 - £168,000

**= 0 or nil variance**

**Material Usage variance for B**

**= [Standard usage – Actual usage] x Standard price**

= [4 kg x 14,000 units – 56,000 kg] Standard price

= [56,000 kg – 56,000 kg] x £3

**= 0 or nil variance**

**Variance analysis statement for direct materials costs for the first quarter**

|  |  |
| --- | --- |
|  | **£** |
| **Standard material costs: 14,000 units x £20** | **280,000** |
| **Direct materials A** |  |
| **Price variance** | **5700 [F]** |
| **Usage variance** | **2000 [A]** |
| **Direct materials B** |  |
| **Price variance** | **0** |
| **Usage variance** | **0** |
| **Total material cost variance** | **3700 [F]** |
| Actual direct material costs | 276,300 |

**Total favourable variance = £5,700**

**Total adverse variance = £2,000**

**Total variance = £3,700 [F]**

**b) From the available information suggest possible explanations for the variances identified.**

**Direct materials price variance [examples]**

**Favourable materials price v ---** Lower quality materials purchased**;** Efficient purchasing management; bulk discounts; new contract with the existing/new supplier with a lower purchase price; took advantage of promotions in the market for the material; purchased substitute materials with a lower price

**Direct materials usage variance**

**Adverse. -----** Low quality material purchased and used may have caused excessive/abnormal wastage; the use of trainees on the production floor has produced abnormal wastage;